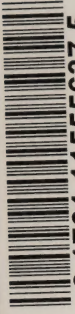


Government  
Publications




3 1761 11555637 5









Digitized by the Internet Archive  
in 2022 with funding from  
University of Toronto

<https://archive.org/details/31761115556375>









DOMINION OF CANADA

Government  
Publication

4233

FOURTH  
ANNUAL REPORT  
OF THE  
DEPARTMENT OF FISHERIES

(SIXTY-SEVENTH ANNUAL FISHERIES REPORT  
OF THE DOMINION)

---

FOR THE YEAR

1933-34



OTTAWA  
J. O. PATENAUDE  
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY  
1934





DEPUTY MINISTER'S REPORT  
CONTENTS

To His Excellency Captain the Right Honourable the Earl of Bessborough,  
P.C., G.C.M.G., Governor General and Commander-in-Chief of the  
Dominion of Canada.

MAY IT PLEASE YOUR EXCELLENCY:

I have the honour to submit herewith, for the information of your Excellency and the Parliament of Canada, the Fourth Annual Report of the Department of Fisheries, being the Sixty-seventh Annual Fisheries Report for the Dominion.

I have the honour to be,

Your Excellency's most obedient servant,

ALFRED DURANLEAU,

Acting Minister of Fisheries.

DEPARTMENT OF FISHERIES,

OTTAWA, April 6, 1934.

## CONTENTS

DEPUTY MINISTER'S REPORT COVERING—	PAGE
Review of the Fisheries, 1933.....	5
Foreign Trade in Fisheries Products.....	13
Fish Inspection Services.....	14
Instructional Work.....	15
Lobster Transportation Service.....	16
Fisheries Intelligence.....	17
Increasing the Demand for Fish Foods.....	18
Fish Culture.....	19
Oyster and Scallop Investigations.....	19
Biological Board's Work.....	20
Fishing Bounty.....	21
Pelagic Sealing.....	23
International Fisheries Commission.....	24
Passamaquoddy Bay Investigations.....	26
North American Council on Fishery Investigations.....	27

## APPENDICES

1. Reports of the Chief Supervisors of Fisheries.....	30
2. Report on the Work of the Biological Board of Canada.....	76
3. Report of the Fish Culture Branch of the Department.....	78
4. Report of the Fisheries Engineer.....	153
5. Report on Inspection of Fish and on Technical Instruction to Fishermen and Fishery Officers.....	162
6. Report on Oyster Cultural Work by the Department in 1933.....	166
7. Report on Scallop Investigations in 1933.....	172
8. A Statement of Fisheries Expenditure and Revenue for 1933 and a Summary of Expenditure and Revenue, by Provinces, for the Period 1867 to 1933.....	173
9. A Summary Showing the Number of Licences Issued in 1933.....	179
10. A Summary of Lobster Fishing Licences Issued Each Year Since 1928.....	182
11. A return Showing the Prosecutions for Offences under the Fisheries Act.....	184



## DEPUTY MINISTER'S REPORT

To the Hon. ALFRED DURANLEAU,  
Acting Minister of Fisheries.

SIR,—I have the honour to submit the Fourth Annual Report of the Department of Fisheries, which is the Sixty-seventh Annual Report on the fisheries of Canada, and is for the fiscal year ended March 31, 1934. The report refers to the following subjects, among others:—

Fisheries Operations in the Calendar Year, 1933.

Fish Inspection Work.

Fisheries Instructional Work.

Fish Culture.

Oyster and Scallop Investigations.

The Work of the Biological Board of Canada.

Fisheries Intelligence.

Lobster Transportation Service.

Foreign Trade in Fisheries Products.

Fishing Bounty Payments.

Pelagic Sealing.

Departmental Effort to Increase the Demand for Canadian Fish Goods.

The Work of the International Fisheries Commission, or Pacific Halibut Commission.

The International Passamaquoddy Commission.

The Work of the North American Council on Fishery Investigations.

The appendices include:—

Report of the Chief Supervisors of Fisheries.

Summary of the Work of the Biological Board of Canada.

Report of the Fish Culture Branch of the Department.

Report on Inspection of Fish and on Technical Instruction to Fishermen and Fishery Officers.

Report of the Fisheries Engineer.

Report on Oyster Cultural Work by the Department in 1933.

Report on Scallop Investigations in 1933.

A Statement of Fisheries Expenditure and Revenue for the Fiscal Year 1933-34 and a Summary of Expenditure and Revenue, by Provinces, for the Period 1867 to 1933-34.

A Summary Showing the Number of Licences Issued in 1933.

A Summary of Lobster Fishing Licences Issued Each Year Since 1928.

A Return Showing the Prosecutions for Offences under the Fisheries Act.

### REVIEW OF THE FISHERIES 1933

The year's total catch of all kinds of fish, both sea and inland, and including shellfish, amounted to 785,460,000 pounds, having a marketed value of \$27,558,053. In comparison with 1932 results these figures represent a decrease

of 20,922,000 pounds in catch but an increase of \$1,600,943 in marketed value. Of the catch, 719,865,000 pounds were taken in the sea fisheries while 65,595,000 pounds were taken from the inland waters of Canada. The sea fisheries production had a marketed value of \$23,494,695 and the inland fisheries output a value of \$4,063,358.

The individual fishery showing the largest gain was the salmon, which had an increased catch and marketed value both in the sea and inland waters.

The total marketed value was divided as follows: To British Columbia forty-three per cent, which is five per cent more than last year; the three Maritime Provinces thirty-six per cent; Quebec and Ontario seven and one-half each and the Prairie Provinces and Yukon the remainder.

Table I, below, shows the marketed value of the 1933 production by provinces, and gives also the figures for each of the four preceding years. In table II, the marketed value figures for the sea and inland fisheries, respectively, for 1933 are shown.

TABLE I

	1933	1932	1931	1930	1929
Nova Scotia.....	6,010,601	6,557,943	7,986,711	10,411,202	11,427,491
New Brunswick.....	3,061,152	2,972,682	4,169,811	4,853,575	5,935,635
Prince Edward Island.....	842,345	988,919	1,078,901	1,141,279	1,297,125
Quebec.....	2,128,471	1,815,544	1,952,894	2,502,998	2,933,339
Ontario.....	2,089,842	2,147,990	2,477,131	3,294,629	3,919,144
Manitoba.....	1,076,136	1,204,892	1,241,575	1,811,962	2,745,205
Saskatchewan.....	186,417	186,174	317,963	234,501	572,871
Alberta.....	144,518	153,789	153,897	421,258	732,214
British Columbia.....	12,001,471	9,909,116	11,108,873	23,103,302	23,930,692
Yukon Territory.....	17,100	20,060	29,550	29,510	24,805
Total.....	27,558,053	25,957,109	30,517,306	47,804,216	53,518,521

TABLE II

	Sea	Inland	Total
Nova Scotia.....	6,010,601	.....	6,010,601
New Brunswick.....	3,038,808	22,344	3,061,152
Prince Edward Island.....	842,345	.....	842,345
Quebec.....	1,601,470	527,001	2,128,471
Ontario.....	.....	2,089,842	2,089,842
Manitoba.....	.....	1,076,136	1,076,136
Saskatchewan.....	.....	186,417	186,417
Alberta.....	.....	144,518	144,518
British Columbia.....	12,001,471	.....	12,001,471
Yukon Territory.....	.....	17,100	17,100
Total.....	23,494,695	4,063,358	27,558,053

*Capital Investment and Personnel.*—The total capital invested in the industry—that is, the amount represented by the plant and equipment in use—was \$40,907,470 of which \$24,912,482 was invested in primary operations or the vessels, boats and gear used in catching the fish while the remainder, \$15,994,988, represents the value of the canneries, fish curing plants, etc., where operations were carried on ashore. The total capital invested shows a drop of less than half a million dollars. While the value of vessels, boats and gear used in the primary industry was slightly more than in 1932, the value of the buildings on shore where canning and fish curing operations were carried on showed a drop of a little more than \$600,000.

The total number of persons employed in the industry was 79,328, of whom 65,391 were engaged in catching the fish and 13,927 employed on shore in canneries and fish curing establishments. In both instances there were slight increases in the numbers employed.

*Major Fisheries.*—The chief branch of the industry, from the monetary standpoint, is the salmon fishery which had a total marketed value for the year amounting to \$9,758,346. The Pacific coast had a production of salmon valued at \$9,184,090. The lobster fishery ranked second, with a marketed value of \$3,524,355, while the cod fishery dropped in value to \$2,598,756. The white-fish fishery, which is the most important of the inland fisheries, had a marketed value of only \$1,136,060, which is only a little more than half what it was a few years ago when market conditions were more favourable.

#### NOVA SCOTIA

The marketed value of the fisheries was \$6,010,601, as compared with \$6,557,943, although the quantity of fish landed, 215,521,700 pounds, was 19,808,100 pounds more than in the previous year. Lobsters again led in point of marketed value, \$1,884,715, while cod was second with a marketed value of \$1,442,599. The catch of lobsters 17,685,800 pounds, a decrease of 6,037,200 pounds, while the catch of cod, 86,603,300 pounds, represents an increase of 7,004,900 pounds. The catch of haddock dropped from 34,706,900 pounds in 1933 to 25,495,400 pounds, while the marketed value of \$799,218 represents a decrease of \$287,125. There were 20,970,600 pounds of mackerel taken, or nearly double the quantity of the year previous, with a corresponding increase in the value. The salmon and alewife catches were slightly less than in 1932 while the smelt catch of 682,800 pounds was only two-thirds of the previous year's landings. There were 450,000 pounds of tuna landed, which was not quite double the catch of 1933, and the 1,713,700 pounds of swordfish shows an increase of 677,800 pounds. A total of 30,750 pounds of scallops brought ashore was 11,263 pounds more than the 1933 catch. The quantity of fish meal produced rose from 2,909 tons to 4,015 tons.

#### PRINCE EDWARD ISLAND

There was a decrease of \$146,604 in the marketed value of the fisheries, the total amounting to \$842,315 for the year. The lobster fishery is the largest branch of the industry in the island and had a marketed value of \$591,801. The catch of 9,154,700 pounds represents a decrease of 2,303,300 pounds from the preceding year. Increased catches of cod, hake, herring, mackerel and oysters were recorded while declines were noted in the landings of haddock, smelts and clams.

#### NEW BRUNSWICK

The fisheries of this province showed an increase both in catch and marketed value. The former, 129,995,200 pounds, shows an increase of 28,340,300 pounds, while the value, \$3,061,152, represents a gain of \$88,470. The increased catches were chiefly in hake, herring and sardines. Roughly speaking, there were four and one-half million more pounds of hake, eleven and one-half million more pounds of herring and twelve and one-half million more pounds of sardines. The salmon catch, which is an important branch of the industry, was 2,261,300 pounds from the sea fisheries and 79,500 pounds from inland rivers and streams. The former figures represent an increase of more than 450,000



pounds while the inland catch was slightly less than in 1932. Smelts are also one of the important species landed in the province but the catch, 5,244,400 pounds, shows quite a drop. The catch of lobsters was also less.

#### QUEBEC

Both the catch of fish and the marketed value of the catch show an increase for the year. The catch was 93,336,100 pounds, which was an increase of 1,364,200 pounds, and the marketed value of \$2,128,471 was \$312,927 greater. The catch of cod, 51,496,200 pounds, increased by 5,423,100 pounds and the marketed value, \$863,913, shows an increase of \$215,191. The cod fishery is the most important branch of the fishing industry in this province. The second largest is the lobster fishery which showed a catch of 3,157,100 pounds for the year and a marketed value of \$217,476. Both of these figures represent small decreases. The catch of salmon, 1,262,800 pounds, shows a small increase while the marketed value of \$139,822 is almost fifty per cent greater. An increase was noted in the catch of smelts and caplin, while smaller catches of halibut, herring, mackerel, clams and scallops were reported. In the inland sections of the province increased catches of catfish, eels, herring, maskinonge, perch, pickerel, shad, salmon, smelts, sturgeon and whitefish were reported. In most cases the increases were not very large. The marketed value of the inland fisheries was \$527,001, an increase of almost \$75,000, while that of the sea fisheries, \$1,601,470, was up about \$238,000.

#### ONTARIO

Production and marketed value both fell off during the year. The catch, 29,201,200 pounds, was less by 1,661,500 pounds while the marketed value of \$2,089,842 shows a drop of only \$58,148. The trout and whitefish fisheries, which are the most important, showed decreases in both catch and marketed value. Blue pickerel and tullibee were taken in increased quantities while fewer herring, perch and sturgeon were caught. The catch of pike was practically the same as in the year previous.

#### MANITOBA

Whitefish, pickerel and tullibee are the chief kinds of fish taken in Manitoba. In the case of tullibee, the year's catch, 1,812,600 pounds and marketed value \$45,931, were off, the latter being less than half the 1932 value. The catch of whitefish, 6,136,700 pounds, shows a substantial increase, more than 750,000 pounds, but the marketed value of \$434,922 was off almost \$20,000. The catch of pickerel, 6,897,400 pounds, was considerably greater than in 1932 but there was a drop in the marketed value, \$382,653, of slightly more than \$45,000. There were more perch and saugers taken but the landings of goldeyes and pike were less.

#### SASKATCHEWAN

Practically no change in the total marketed value of this province is noted, the figures for the years 1933 and 1932 being \$186,417 and \$186,174, respectively. The chief fishery is for whitefish and the catch of 2,574,000 pounds shows an increase of slightly more than 500,000 pounds, but the marketed value of \$125,653 was less by \$4,758. Increased catches were made of ling, pickerel, pike, trout and tullibee, with corresponding increases in marketed value.

## ALBERTA

Increased catches were reported in whitefish, pickerel, pike and tullibee, but there were smaller landings of trout. The total marketed value, \$144,518, was slightly less than in 1932. The main fishery, that of whitefish, showed a catch of 1,396,900 pounds, or slightly more than in the year before, while the marketed value of \$81,868 was less by \$10,000 and more.

## BRITISH COLUMBIA

The total landings of fish in British Columbia were 290,234,500 pounds, having a marketed value of \$12,001,471. While the catch shows a drop of some 57,000,000 pounds, the marketed value increased more than \$2,000,000. The "big three" of the industry, salmon, halibut and herring, each showed a substantial improvement both in catch and marketed value. The salmon catch of 141,050,400 pounds had a marketed value of \$9,184,090; herring landings were 107,737,300 pounds with a marketed value of \$738,532, and the halibut catch was 17,081,300 pounds, worth \$1,391,941. The pack of salmon was 1,265,072 cases with a value of \$7,428,125. This represents an increase of more than 180,000 cases and \$1,000,000 in value. The quantity of dry salted herring, which is shipped to the orient, was almost double that of the year before, 51,302,400 pounds being produced. For some unknown reason, the pilchard run did not materialize and the landings of 6,535,300 pounds showed a drop of some 82,000,000 pounds. The quantity of pilchard meal and oil produced were, of course, in the same reduced proportions. Whaling operations were again carried on and the 209 whales captured had a marketed value of \$110,030.

## YUKON TERRITORY

The commercial fisheries of the Yukon are confined to a few varieties, the most important of which is salmon. The catch of this species, 50,000 pounds, shows a decrease of 13,000 pounds, while the marketed value of \$7,500 is almost \$2,000 less. The marketed value for the Territory was \$17,100.

## ATLANTIC COAST RESULTS

The total landings of fish and shellfish on the Atlantic coast during the year were 444,148,700 pounds as compared with 405,603,900 pounds in 1932. By provinces the catch was distributed as follows:—

Province	Pounds
Nova Scotia.....	215,521,700
New Brunswick.....	112,943,600
Quebec.....	93,336,100
Prince Edward Island.....	22,347,300

*Cod, Haddock, Hake and Cusk and Pollock.*—The total quantity of these varieties landed was 205,577,600 pounds, as compared with 199,221,500 pounds in the year preceding. The landings of cod were greater than in 1932, and each of the provinces contributed to this increase. Nova Scotia and Quebec, where the heaviest cod landings are made, showed catches of 86,603,300 pounds and 51,496,200 pounds, respectively. The haddock landings were somewhat smaller than in 1932. In Nova Scotia, where the great bulk of the haddock landings take place, the catch dropped from 34,706,900 pounds in 1933 to 25,495,400 pounds for the year under review. The quantity of hake and cusk landed increased somewhat, large catches being made in the county of Charlotte, New



Brunswick. An increase was recorded here of 131 per cent, which is attributable to the bonuses paid on this species by the government of the province. A drop was recorded in the total catch of pollock, although New Brunswick recorded a slightly greater catch. These fish were landed only in Nova Scotia and New Brunswick. The total marketed value of the several species referred to in this paragraph was \$3,611,704, as compared with \$3,493,629 in 1932. The province of Nova Scotia showed a drop in value but there were increases in the other three provinces.

*Herring, Mackerel, and Sardines.*—Increased catches, by provinces, were reported except in Quebec. The total landings of the three kinds were 146,943,900 pounds to which the province of New Brunswick contributed 75,206,100 pounds. Nova Scotia's catch of mackerel, 20,970,600 pounds, was almost double that of the preceding year, as was New Brunswick's catch of sardines, which amounted to 26,022,400 pounds. Decreased landings of herring and mackerel were reported from Quebec. The marketed value of the three kinds was \$1,931,773, which was an increase of \$493,040. Sardines, with a marketed value of \$622,531, in New Brunswick, accounted for almost \$200,000 of the increase.

*Flounders, Halibut, and Swordfish.*—While the catch of flounders decreased from 631,800 pounds to 612,600 pounds in 1933, there were increases in the landings of halibut and swordfish. The catch of halibut, 3,001,100 pounds, showed an increase of 501,300 pounds, while the quantity of swordfish taken, 1,713,700 pounds, increased by more than 677,000 pounds. Swordfish are taken off Nova Scotia only and the greater part of the halibut and flounder catch is also landed from Nova Scotia waters. Halibut had a marketed value of \$302,464, as compared with \$267,514 in 1932, while swordfish had a value of \$208,038, or an increase of some \$108,000. Much better prices were realized by the fishermen for their catch during the season than in the year before.

*River Spawning Fish.*—The catch of salmon, both sea and inland, amounted to 4,549,700 pounds or an increase of 656,000 pounds. The marketed value of \$566,256 shows a proportionate increase. The greatest catch of this species is off the Northumberland Strait shore of New Brunswick, although a large catch is also made in Quebec. While smelts are landed in all four provinces, the greater catch is in New Brunswick where 5,244,400 pounds out of a total catch of 7,719,000 pounds was made. The marketed value of New Brunswick smelts was \$315,485 out of a total of \$490,716. There were smaller catches in each province in 1933 except in Quebec, where the increase amounted to 150,000 pounds.

Alewives are taken in quantities in Nova Scotia and New Brunswick and a few in Prince Edward Island. The total catch of 7,374,900 pounds shows a large gain over the catch of the year previous, when 5,844,400 pounds were landed. The catch does not represent the plentifulness or scarcity of these fish as much larger quantities could be taken if there were a demand.

*Lobsters.*—From the marketed value standpoint, the lobster fishery is the most important branch of the fishing industry on the Atlantic, although some years ago the cod fishery held first place. The year's lobster catch, 37,491,600 pounds, had a marketed value of \$3,524,355. These figures represent a drop both in the catch and value. In 1932 the catch was 48,348,800 pounds and the marketed value \$4,745,311. Each of the four provinces recorded a decreased catch in 1933, Nova Scotia's dropping 26 per cent, New Brunswick's 25 per cent, Prince Edward Island's 20 per cent and Quebec's three per cent. In the tables which follow will be found the statistics covering the lobster catch its marketed value and the disposal of the catch by provinces for the past three years.



## CATCH

	1933		1932		1931	
	Cwts.	Marketed Value	Cwts.	Marketed Value	Cwts.	Marketed Value
		\$		\$		\$
Nova Scotia.....	176,858	1,884,715	237,730	2,711,371	223,649	2,725,620
New Brunswick.....	74,940	830,363	98,722	1,041,845	94,988	1,376,257
Prince Edward Island.....	91,547	591,801	114,570	750,039	94,150	754,542
Quebec.....	31,571	217,476	32,466	242,056	22,703	180,609
Totals.....	374,916	3,524,355	483,488	4,745,311	435,490	5,037,028

## SHIPPED IN SHELL

Nova Scotia.....	84,271	1,087,770	99,527	1,418,178	96,793	1,500,883
New Brunswick.....	27,286	348,473	37,777	471,288	39,046	738,225
Prince Edward Island.....	9,508	71,258	3,549	29,277	6,503	60,820
Quebec.....	2,800	25,525	3,630	29,400	741	7,550
Totals.....	123,925	1,533,026	144,483	1,948,143	143,083	2,307,478

## QUANTITY CANNED

Nova Scotia.....	50,729	754,590	74,060	1,245,654	63,940	1,156,038
New Brunswick.....	26,417	454,424	35,490	537,991	34,476	627,860
Prince Edward Island.....	32,895	512,138	44,490	711,119	37,055	683,247
Quebec.....	12,021	191,781	12,759	212,656	9,190	172,718
Totals.....	122,062	1,912,933	166,799	2,707,420	144,661	2,639,863

## TOMALLEY

Nova Scotia.....	2,432	18,988	2,624	19,415	3,754	51,139
New Brunswick.....	236	1,825	190	1,486	107	1,222
Prince Edward Island.....	1,032	6,905	939	8,323	815	8,255
Quebec.....	25	170	.....	.....	22	161
Totals.....	3,725	27,888	3,753	29,224	4,698	60,777

## LOBSTER MEAT

Nova Scotia.....	602	23,367	506	28,124	322	17,560
New Brunswick.....	553	25,641	751	31,080	179	8,950
Prince Edward Island.....	26	1,500	22	1,320	37	2,220
Quebec.....	.....	.....	.....	.....	5	180
Totals.....	1,181	50,508	1,279	60,524	543	28,910

*Other Shellfish.*—Among the other kinds of shellfish landed on the Atlantic coast clams and quahaugs had a marketed value of \$54,793 compared with \$78,003 in the year previous. New Brunswick, where the largest production occurs, showed a slight increase in the landings. Oysters are landed in all four provinces but the landings are greatest in the province of New Brunswick, where 10,162 barrels were taken. This is slightly less than in the year previous. In Nova Scotia, 3,388 barrels were landed and in Prince Edward Island 6,643 barrels. In addition to clams, quahaugs and oysters, some small quantities of crabs, mussels and winkles were landed.

## DEPARTMENT OF FISHERIES

## INLAND FISHERIES

There were 65,575,300 pounds of fish taken in the inland waters of Canada, with a marketed value of \$4,063,358, compared with landings of 63,496,300 pounds in 1932 having a marketed value of \$4,194,022. The following table shows the landings of the chief varieties for the past three years:—

	1933	1932	1931
	lb.	lb.	lb.
Whitefish.....	15,213,500	13,847,800	15,785,600
Pickarel (or doré).....	10,627,200	8,949,800	9,182,100
Tullibee.....	4,230,000	4,764,400	4,279,500
Trout.....	5,073,400	5,007,200	7,155,700
Pike.....	4,114,600	4,140,000	5,928,600
Herring.....	3,418,000	3,669,200	5,950,800
Perch.....	4,036,700	6,021,300	5,037,600
Eels.....	2,495,000	1,930,700	1,786,700
Blue pickerel.....	4,216,400	4,061,000	5,404,800
Mullets.....	236,200	400,000	358,100
Carp.....	1,854,500	1,806,100	1,600,200
Goldeyes.....	287,600	309,700	350,900

In the inland waters of New Brunswick, shad are taken in the greatest numbers while salmon have the largest marketed value. During the year, the landings of both varieties showed a decrease. Eels, which are the most valuable catch in inland Quebec, were landed to the amount of 2,414,500 pounds and had a marketed value of \$128,285. Taking the inland waters as a whole, the most important species landed was the whitefish, which had a marketed value of \$1,136,400 compared with \$1,193,634 in the earlier year. In Ontario the next most important kinds to whitefish were trout and blue pickerel, which showed slightly larger catches than in 1932. The catch of pickerel was greater in Manitoba and Saskatchewan than in the year before, but the marketed value was less. In Alberta, however, pickerel catch and marketed value showed increases. In the Yukon territory salmon are taken in larger quantities than any other species.

## PACIFIC COAST FISHERIES

The total quantity of fish landed on the Pacific coast was 290,234,500 pounds, having a marketed value of \$12,001,471 as compared with 347,494,600 pounds in the year previous and a marketed value of \$9,909,116. Both in point of landings and marketed value the salmon fishery is the largest and most important branch of the Pacific industry. Some 141,050,400 pounds were landed in 1933, having a marketed value of \$9,184,090. The pack of canned salmon was 1,265,072 cases with a marketed value of \$7,428,123 compared with 1,081,011 cases valued at \$6,357,813 in 1932. The increase in the pack was in pink salmon. A fairly large increase was noted in the amount of salmon used fresh while the quantity of salmon oil produced jumped from 10,370 gallons to 63,830 gallons.

*Halibut.*—Next in importance to the salmon is the halibut industry. The catch of 17,081,300 pounds represents an increase of almost 200,000 pounds while the marketed value of \$1,391,941 show an increase of more than \$430,000. The increased use of halibut liver oil is reflected in the greater value of the halibut livers. Although the quantity of livers sold, 229,300 pounds, only shows an increase of 72,000 pounds, the value jumped from \$29,571 to \$45,995.

*Herring.*—The third large branch of the industry on this coast is the herring fishery. The catch of 107,737,300 pounds had a marketed value of \$738,522. The landings increased 7,416,900 pounds, the marketed value \$202,031. The greatest increase in herring business was in the trade with the Orient in the dry-salted fish.

*Pilchards.*—The pilchard, which is taken only on the Pacific coast, is used almost altogether in the production of meal and oil. For some unknown reason these fish did not appear in anything like normal numbers at the usual season in 1933 and such schools as were located later on—and only few schools were sighted—were far from shore. The catch was only 6,535,300 pounds with a marketed value of \$77,464, as compared with 88,696,400 pounds and \$383,920 in the year previous. The quantity of meal produced was 1,108 tons, compared with 8,842 tons in 1932, and of oil 275,879 gallons, compared with 1,315,864 gallons.

*Other Fisheries.*—Among the other kinds of fish landed by British Columbia fishermen are the different cods, black, grey, ling and red and rock; grayfish, used in the production of meal and oil; and shellfish, including clams, crabs, oysters and shrimps. Whaling is carried on by one company, having two stations, one of which was in operation during 1933. No whaling operations were carried on in 1931 or 1932. The number of whales taken in 1933 was 209.

## FOREIGN TRADE IN FISHERIES PRODUCTS

Canada's export trade in fisheries products in 1933 (calendar year) showed encouraging improvement over the business of the year previous. Import trade, on the other hand, had smaller value than in 1932. Setting import decrease over against export gain, the net result was that total foreign trade showed an increase of slightly more than \$1,333,500. More than half of the increase came about through great expansion in the sales of canned salmon to France under the trade agreement between the two countries.

The value of the foreign trade for the year amounted in all to \$21,809,668, as compared with \$20,476,142 in 1932. To this value total the export business contributed \$20,206,904, an increase of \$1,470,661, and import trade \$1,602,764, a decrease of \$137,135.

The United States continued to be the largest single buyer of our fisheries products, with the United Kingdom coming second. Purchases by the United States had a total value of \$8,791,616 and those made by the United Kingdom were valued at \$4,371,748. Much the greater part of the business with the United States was in fresh and frozen fish, with the sales amounting to \$6,626,686 or 75 per cent of the total value of the exports sent across the border. Canned or preserved fish made up most of the shipments to Great Britain. Canned salmon, \$2,339,298, represented almost 54 per cent of the total value of the exportation to this market and canned lobsters something over 28 per cent, or \$1,226,296.

On both sides of the year's account, export and import, the largest business, reckoning on the value basis, was in canned or preserved fish. (The term "fish" is used as including shellfish). Imports in this classification amounted to \$659,554, or slightly more than 41 per cent of the total; canned sardines from Norway made up the largest single item under this head. In the case of exports, canned or preserved fish made up 40 per cent of the foreign sales, or \$8,141,552 out of \$20,206,904. The other three general categories in which fisheries products are classified for purposes of trade record are fresh and frozen fish, dried, smoked, pickled, and salted fish, and other articles of the fisheries, the last category including such commodities as fish meal and oil. The exports under these different heads in 1933 were as follows:—

Fresh and frozen fish—\$7,492,277, or a little more than 37 per cent of the total export business.

Dried, smoked, pickled and salted fish—\$4,002,255, or nearly 20 per cent of the total.

Other products of the fisheries—\$570,820, or about 3 per cent of the total.



As already indicated, the outstanding trade development of the year was the great increase in the export business done with France in canned salmon. Both in quantity and value—119,571 hundredweights and \$916,433—this business with France was more than ten times as large as in the year before. Sales of canned salmon to Australia and one or two other countries also increased. The sales to the United Kingdom were below the 1932 level but, on the other hand, the sales of fresh and frozen salmon from Canada in the British market were nearly twice as large as in the previous year, or 49,000 hundredweight, roundly stated, and their value, \$672,500, also showed an increase not far short of 100 per cent. Other large export gains included a betterment of over \$251,000 in the trade in drysalted herring, a commodity which is shipped almost wholly to the Orient, an increase of \$198,800 in the sales of fresh and frozen halibut to the United States, an increase of over \$197,000 in the business in dried codfish, another of \$134,000 and more in the sales of whitefish to United States importers, and a gain of more than \$118,000 in the trade in pickled salmon.

### INSPECTION OF FISH PRODUCTS

During the fiscal year almost 405,200 packages of fish products and containers were inspected on the Atlantic coast under the Fish Inspection Act and on the Pacific coast more than 127,100 boxes of drysalted herring containing 400 pounds each, while over 1,395,200 cases of canned salmon were inspected in British Columbia under the Meat and Canned Foods Act. In addition, several thousand inspections of fish-curing establishments were carried out under the former act, and under the Meat and Canned Foods Act there were frequent inspections of the 354 fish canneries in operations and their raw materials and processes. With the exception of the canned salmon inspection, which was performed by the federal Board of Canned Salmon Inspection, all of this great body of work was done by the department's permanent fishery inspectors as one part of their regular duty. All of these inspectors have been qualified for this service by special courses of instruction in the past few years, examinations being given at the end of each course.

In recent years Canada's fish inspection systems have been extended in their application and their requirements have been made stricter. It was in 1932, for instance, that regulations were made effective which forbid any canned salmon put up in British Columbia, the great producing centre, from being shipped to market until it has been inspected by the permanent board set up for this purpose and has been found to satisfy the conditions laid down under authority of the Meat and Canned Foods Act. At the middle of 1933 another important change was made to give further guarantee of quality production and regulations were made operative providing for compulsory inspection of certain products coming under the Fish Inspection Act, as, for example, pickled and smoked herring. Prior to that time inspection was made compulsory, although certain standards as to quality and grading had been established. Under the new conditions the products in question may not be shipped or sold until the fish themselves and the containers holding them have been inspected and marked in prescribed form by a qualified inspecting officer.

One result of these extensions of inspection systems, and steps similar to them, has been that the work of inspecting officials has been greatly increased, and for a time during the past year some inspectors were so overtaxed that other qualified officers from outside their districts had to be sent to assist them. But the result of outstanding significance is that the inspections have shown that all save very small percentages of the products inspected have been up to the prescribed standards as to quality, or, in other words, Canadian producers generally are putting up quality goods. A few figures in this regard may be interesting here, although inspection work is reviewed in more detail in Appendix No. 5 of this report.

Out of the 1,395,218 cases of canned salmon inspected in British Columbia during the year 1,376,734 cases were found to merit certificates of approval from the inspecting board, 17,311 were below certificate standard but were sound, wholesome, and fit for human food and were graded and marked "Second Quality," while only 1,173 cases were below "Second Quality" and were, therefore, confiscated. Of more than 220,000 boxes of smoked round herring inspected under the Fish Inspection Act on the Atlantic coast only 1,000 boxes were below the prescribed quality. Slightly more than 61,200 packages of pickled mackerel were inspected, and all save 857 barrels were up to the required standard. The case of oysters inspected on the Atlantic coast was striking. The inspectors passed upon 13,658 barrels and boxes of oysters and of all this quantity only four boxes did not satisfy the conditions laid down by the regulations.

The department has been laying increasing emphasis upon quality production in recent years. Quality has been stressed in all its educational work among the producers. As already indicated, regulations as to inspection have been stiffened and their application widened. All this has been done because it is so manifestly true that unless Canada's fisheries products are of high quality they cannot hope to find increased sale in the home market or to compete successfully in the foreign field with goods from other leading fisheries countries. Happily, most of the producers have been found ready to recognize the soundness of this position and to comply to the best of their ability with the requirements laid down under the inspection acts. The records of inspections during the past year are gratifying evidence to this latter effect.

### INSTRUCTIONAL WORK

In making reference to instructional work done by the department a specific incident may be cited from the year's records as indicative of the value of the policy of making advice from experts available to fishermen in their own communities. In the course of last season a producer in eastern Nova Scotia shipped to Massachusetts a large cargo of pickle-cured cod which had been prepared in accordance with the method taught by instructors sent out by the department. Some discussion as to terms took place between shipper and buyer before the fish went forward but no definite agreement as to price was made. When the cargo reached Massachusetts the buyer found it of such excellent quality that he described it as one of the best shipments he had ever seen, and what was still more convincing he paid substantially more for the fish than the price suggested before the consignment had gone forward. The incident was perhaps more striking than others which have occurred but it was not the first happening which has shown the soundness of the course which the department has been taking in the past few years and the advantage which may be reaped by the fishermen through following the instructors' advice. It may also be said that buyers in the United States, which is the principal market for Canadian pickle-cured cod, have made it clear that they are prepared to increase their purchases in any districts where the fishermen follow satisfactorily the advice and instructions brought to them by the department.

During the past year instructors in pickle curing were in the field in Prince Edward Island and in Nova Scotia. The work was under the immediate supervision of a departmental officer of long experience in fish curing and working under him were four competent assistants who, by actual demonstrations, showed how the cod should be split, salted, and cut. Pickle curing instruction was extended during the 1933 season to a number of areas not previously covered, the greatest extension taking place in the eastern mainland of Nova Scotia and in Cape Breton Island.

Instructors in the method of preparing dried cod in what is known as "Gaspe cure" were also placed in the field by the department during the year.



One was employed in the Magdalen Islands and the other in Gloucester county, N.B., the former giving instruction at fifteen fishing settlements and the latter at about a dozen. Both gave demonstrations of the most approved methods of splitting, washing, salting, and drying the fish, and gave oral instruction, and supervised the fishermen's own drying operations.

Instructional work of the year also included several special courses given for fishermen and others at stations of the Biological Board of Canada. Reference to these courses is made in other paragraphs of this review and in Appendix No. 2 and Appendix No. 5.

## LOBSTER TRANSPORTATION SERVICE

The subsidized boat service arranged by the department for the transportation of live lobsters from eastern Nova Scotia to the ports of Boston and Gloucester, Massachusetts, was again operated during the 1933 lobster fishing season. There were four boats in use at various times during this period, the first trip being made on April 17 and the last trip on July 19. The total number of crates carried was 11,690, containing an estimated weight of 1,605,150 pounds of lobsters. In the previous year the quantity transported was 1,623,210 pounds. The charge made to the fishermen for carrying the lobsters by this service was \$3 for each crate of approximately 150 pounds, the charge covering also the return of the empty crate. The cost of the service to the department during the past year was \$17,869.19.

Collections were made at St. Peters, Arichat, Petit de Grat, Queensport, Canso, Dover, Whitehead, Port Felix, Coddles Harbour, Fisherman's Harbour, and Drum Head, and fishermen from nearby settlements brought their lobsters to these ports for shipment. Lobsters were brought to Petit de Grat from ports on almost the entire coast of Cape Breton by an independent collection service for transshipment to United States ports via the Government subsidized service. Shipments were also brought from the mainland ports as far as Arisaig in Pictou county by an independent service and transferred to the Government service at Queensport and Canso. It was found that in a number of instances the lobsters brought in from outside ports and transferred to the Government service for shipment were in a poor condition and consequently greatly increased the quantity condemned at the port of delivery. The total quantity condemned, however, was only 49,150 pounds or slightly over three per cent. In this connection acknowledgment should be made of the courtesy of the Massachusetts authorities in making available to the department a report on each shipment arriving within their jurisdiction on the subsidized boats. These reports were made by officers of the Massachusetts Bureau of Marine Fisheries, and showed what quantity of lobsters was condemned in each shipment and what the temperature levels had been in the hold of the carrying vessel during its voyage. This information was of considerable value to the department in the supervision of the service.

The transportation service was found to be of very great benefit to the fishermen, enabling them to realize a better price for their fresh lobsters than they could otherwise have hoped to receive. In the cases in which shipments did not reach the port of delivery in good shape—and, as the figures given above have indicated, such cases were relatively few—the cause would seem to be found that the lobsters had been held too long by the shippers before being sent forward and were consequently not in first class condition when shipped. The fact cannot be too strongly stressed that fishermen must ship only fresh caught lobsters or lobsters in first class condition; if the lobsters are not in such condition to start the trip the financial returns will be much less than had been hoped. It has been satisfactorily demonstrated that where shipments are



made of lobsters in first class condition there is little if any deterioration during the trip and they arrive at Massachusetts in such shape as to commend the highest of prevailing prices.

*Packet Service.*—Assistance on a subsidy basis was continued during the year to a schooner packet service between L'Ardoise, Cape Breton and Halifax. As noted in previous reports, this service has been assisted by the department because adequate transportation facilities are lacking in the L'Ardoise district. The packet service aids the fishermen in marketing their catches and in obtaining supplies.

## FISHERIES INTELLIGENCE

By means of radio broadcasts arranged for by the department the fishermen of the Atlantic coast were again supplied last year with daily weather forecasts and with regular reports as to the quantities of bait and ice available at various ports. Such a service is not required on the Pacific coast, where the conditions attending fishing operations are different from those in the eastern area, but each successive year brings added confirmation of the value of the Atlantic broadcasts, which were initiated by the department several years ago. There has been frequent testimony from fishermen as to the assistance they often derive from these broadcasts in planning their operations from day to day, and the continuance of the service is abundantly warranted.

The weather reports are broadcast twice daily throughout the year from Saint John, N.B., Halifax N.S., and Louisburg, N.S. The summaries of bait and ice conditions are included in the messages from Louisburg and Halifax during all of the year save two or three of the winter months when they are not required. Rebroadcasts of the reports are made from C.G.S. *Arras*, the departmental ship which goes to the Newfoundland banks with the Canadian fishing fleet each year, and with the service from the stations at shore and the rebroadcasts from the *Arras* there is a wide coverage. The weather reports sent out are those of the Meteorological Service of the Dominion while the summaries of bait and ice conditions are made up at the department's Eastern Division office at Halifax from reports telegraphed to the office daily by fisheries officers in various parts of Nova Scotia and the Magdalen Islands. Through the co-operation of the Newfoundland Department of Marine and Fisheries it is also possible to include in the broadcasts information as to bait supplies available at different points in Newfoundland.

During the year the department continued to issue its Fisheries News Bulletin, which has been found useful from the departmental point of view and of interest to many persons, newspapers, and institutions throughout the country. Numerous requests from persons and organizations desiring to be placed on the bulletin mailing list were received during the year. The paper is published monthly and both English and French editions are circulated.

The printed Quarterly Bulletin of Sea Fisheries Statistics, which the department had been issuing for some time, was discontinued at the beginning of the fiscal year. The Quarterly Bulletin was a purely statistical publication and while it was of interest to persons concerned with fisheries matters it was felt that in view of the need for economy its issuance might reasonably be stopped for the present. When financial conditions permit, it is possible that its publication may be resumed.

An important part of the work done during the year consisted in supplying special articles relative to the fisheries which had been asked for by various newspapers and in dealing with numerous requests for information regarding the Dominion's fish and fisheries resources, the fishing industry, methods of home processing, and so on. The larger number of the inquiries were for general information or for departmental pamphlets, etc., but there were also many cases in

which questions of a technical nature were brought forward for answer. Frequent requests for fisheries material were received from school pupils and teachers, and it is the department's policy to comply with these requests, not perfunctorily, but as fully as possible since it is believed that in this way a good deal may be accomplished toward increasing interest in the fisheries and emphasizing the importance of the fishing industry from the national point of view.

### INCREASING DEMAND FOR FISH FOODS

In further endeavour to enlarge the domestic demand for Canadian fish foods the department continued during the year the program of fish cookery demonstrations and addresses on the food and health values of fish and shellfish, which it began in 1931-32. Mrs. Evelene Spencer, specialist in fish cookery, was kept in the field and it is very satisfactory to record that the work which the department carried on through her continued to command the approval of the fishing industry and to arouse a good deal of popular interest, chiefly, of course, among the housewives. Representatives of the fish trade and members of the general public alike have spoken of the interest which was created in different communities where demonstrations were held and addresses given. The point is also to be made, however, that if the maximum benefit is to be obtained from this continuing departmental effort it is essential that those engaged in marketing Canadian fish foods in the Dominion shall be energetic to capitalize upon it. The department's campaign throughout the country is widening fish marketing opportunities but the industry must be alert to make the most of them if it is to gather the full advantage of what is being done to assist it.

In the first part of the past fiscal year Mrs. Spencer carried on her work in several cities in Alberta and Saskatchewan and then in Winnipeg. In all three Prairie Provinces she had the co-operation of the respective provincial departments concerned with fisheries matters. The period from the end of June to early September was spent in Toronto and Ottawa but since the summer season is not an opportune time for demonstration work the program in those cities was confined to radio talks. Following the time spent in Toronto and Ottawa, Mrs. Spencer was sent to Montreal. Like Toronto and Ottawa and one or two other centres, Montreal had been visited on a previous occasion but as the city is the largest centre of population in the Dominion it was decided that a further extended series of meetings should be held there. As it turned out, however, the interest was so well sustained, and so many additional demonstrations were desired, that arrangements had to be made to carry on a much longer program than had originally been planned. In addition to demonstrations at two of the city's largest departmental stores there were demonstrations and addresses at numerous institutions, where the audiences included domestic science teachers and pupils, and frequent radio talks were also given. Both English and French were spoken at the demonstrations and in the radio talks so that the information imparted might come to members of the audiences in the language with which they happened to be most familiar.

At the close of the fiscal year the Montreal program was nearing its conclusion. The work will be continued in various parts of the Dominion during the coming year for it is clear from what has already been accomplished that the plan which has been followed is an effective one. Detailed arrangements for the new year have not yet been made, of course, but it is probable that there will first be another series of demonstrations in Toronto. Other Ontario cities may also be visited. Later on, it is expected Mrs. Spencer will go to the Maritime Provinces, demonstrating and giving addresses in different centres.

Reference to the department's campaign to widen knowledge of Canadian fish foods and to stimulate demand for them would be incomplete unless



acknowledgment were made of the generous co-operation extended by radio stations in all parts of the country where Mrs. Spencer has conducted her work. Almost without exception the stations which have been approached have readily granted the use of their facilities. The result has been that many thousands of people who could not attend the cookery demonstrations have been reached by informative addresses about fish foods, their value in the diet, the best and easiest ways of preparing them for the table. The department is glad to place formally on record its appreciation of the courtesies which the various stations have extended to it.

In addition to conducting the demonstration work during the past year the department also sought to direct increased attention to the importance of the fisheries to Canada by displaying appropriate exhibits at several of the larger fairs—the Canadian National Exhibition at Toronto, the Central Canada Fair at Ottawa, and the Produced in Canada Exhibition at Montreal. These exhibits, which were all prepared by members of the department's Ottawa staff, attracted much attention. Besides possessing intrinsic educational value they also served the useful purpose of prompting many inquiries from spectators regarding fish and shellfish and the fishing industry of the Dominion and thus opening an opportunity for departmental officers on duty at the exhibitions to give out valuable information regarding the fisheries.

### FISH CULTURE

Fish cultural work is carried on by the department in Nova Scotia, New Brunswick and Prince Edward Island in the east, and in British Columbia in the west. The operation of the hatcheries located in the National Parks in Alberta is also directed by the Department of Fisheries but at the expense of the National Parks branch, Department of the Interior. Operations by the Department of Fisheries include the propagation of the more important fresh water and anadromous food and game fishes such as Atlantic and seabago salmon and speckled, rainbow, brown, Loch Leven, Kamloops, salmon and hybrid trout in the east, and sockeye, spring, pink, coho, Kennerly's, Atlantic and steelhead salmon and Kamloops, cutthroat, rainbow, brown, Loch Leven, speckled and salmon trout in the west.

During 1933 there were in operation 24 main hatcheries, 9 subsidiary hatcheries, 8 salmon retaining ponds and several egg-collecting camps. The total output for the year was 109,560,039.

A detailed report on fish culture operations during the past year is to be found in Appendix 3 of this report.

### OYSTER AND SCALLOP INVESTIGATIONS

Continuation of the department's program for encouraging oyster farming, and assisting oyster farmers, was an important feature of the year's work on the Atlantic coast. Scallop investigations, or exploratory trips by a departmental boat for the purpose of locating additional scallop beds, were also continued in certain Atlantic areas during the year, and in passing it may be added that some similar work may be undertaken off northern British Columbia during the coming fiscal year. Up to the present the scallop fishery has been carried on in Atlantic waters only but as numbers of empty shells have now been found on British Columbia beaches bordering Dixon entrance, plans for an examination of this region, with a view to determining whether or not any scallop beds of commercial size are present, are now being considered by the department.

*Oyster Investigations.*—Most of the oyster work of the past year was done in Prince Edward Island, where, several years ago, the department took initial



steps in Malpeque bay looking toward the development of oyster farming. Some work was also done in the Westmorland county portion of Shediac bay, New Brunswick, where investigations designed to determine the feasibility of oyster farming in that area were undertaken by the department in 1931, following the transfer of the control and administration of the mollusk beds from provincial to federal hands.

There were three major items in the year's work in Shediac bay. One consisted of cleaning a bed and stocking it with 113 barrels of oysters from the Richibucto river, one of the well-known New Brunswick oyster areas. The indications were that with some modifications the transplanting method which was followed might be of value in stocking the bay, but positive conclusions on this point cannot yet be reached. The other two main items in the Shediac work consisted of further trials in spat collection and of making a survey of the existing oyster populations to ascertain the most suitable part of the area to use as a reserve for the maintenance of a sufficient spawning stock.

In Prince Edward Island during the year the number of areas under lease from the department for cultivation as oyster farms increased from twenty-seven (the 1932 figure) to fifty seven, each figure including one area held under a deed issued in earlier years but now farmed by the owners in accordance with the departmental program. (In the case of several of the areas included in the 1933 figures, final formalities in connection with leasing had not been completed but the application for leases had been approved by the department). All of the leased areas being farmed in 1932 were in the Malpeque Bay region but in 1933 two leases were taken out in the Cascumpeque district, three in Savage Bay and six in Covehead and Brackley bays, while the farms in Malpeque bay increased to forty-five. The leased ground under cultivation in waters of the province at the end of the year totalled approximately 244 acres. A summary of what has been done in the way of cultivating the areas since the first leases were granted shows that more than 1,200 barrels of oysters have been planted, in addition to large quantities of shells with spat or to collect spat, and a satisfactory production is promised for the near future.

During the year the department's experimental work on various beds or plots was continued in Prince Edward Island. However, since a detailed review of what has been accomplished in this regard is contained in Appendix No. 6 of this report, it is not necessary to say more here than that some very useful results have been obtained and the department's experiments and investigations promise to be of great assistance to the oyster industry in building up production.

Scallop Investigations—Exploratory dragging for scallops was done by the departmental scallop boat, the *A. Halkett*, off Richmond county, Nova Scotia, off the north and east coasts of Prince Edward Island, and off Charlotte county, New Brunswick. In the Richmond county area no beds of commercial size were found. Off Charlotte county two beds were located which gave promise of yielding scallops in paying quantities. The dragging off Prince Edward Island revealed that on some large beds which the department had located in 1932 there had been very heavy mortality. The exact cause of this condition was not clear and the question was referred to the Biological Board for study.

A review of the dragging operations for the year will be found in Appendix No. 7.

## WORK OF THE BIOLOGICAL BOARD

Although reduction in parliamentary appropriations necessarily led to some curtailment of the work of the Biological Board of Canada a good deal of valuable investigation and experimentation in connection with scientific and technical questions relating to the fisheries was done during the year at the board's research centres, or stations. All four of the stations maintained by the board, which is the federal fisheries research organization, and, working under

the control of the Minister of Fisheries, is virtually the scientific division of the department, were engaged with various problems while the substation at Cultus lake, B.C., continued its work on the natural history of the Pacific salmon and the second substation, at Ellerslie, P.E.I., carried on further study and experiment touching oyster culture. The four stations are situated at St. Andrews, N.B., Nanaimo, B.C., Halifax, N.S., and Prince Rupert, B.C., respectively. The first two are concerned with purely scientific research and are known as Fisheries Biological Stations; the others, which are called Fisheries Experimental Stations, deal with practical problems such as the improvement of methods of handling and processing fish. While the members of the board serve as such without remuneration, a small but efficient staff of research workers is employed at each station.

One of the important pieces of work done on the Atlantic coast during the year consisted of continued study and experiment in connection with the smoking of fish by conditioned air. The particular objects in view were reduction in the cost of apparatus and the prevention of what is known as "banding" in the colour of smoked fish. Success was achieved in both these respects, but the work on smoking will be carried further during the coming year. Other work on the practical side which was done in the Atlantic area included the development of improvements in the methods of canning tuna and mackerel; experiment in the rearing of oyster spat on cultch suspended in baskets in the water, a method which protects the spat from silt and from star-fish; and an attack on the problem of devising a moderate cost system of cold storage for bait. Numerous analyses and determinations of the nutritive values of fish meals were made, and various other matters were taken up, including the determination of the amount of gastric juice secreted as the result of partaking of different fish foods, a study which is of dietetic importance. In the biological field the Atlantic coast undertakings included, among others, certain studies of the herring runs of the Passamaquoddy Bay region, research as to the distribution and migration of cod in the Halifax area, and a continuance of the studies of the natural history of the Atlantic salmon.

On the Pacific coast the study of fish oils continued to have important place in the board's research. At the Prince Rupert station "marinol", a medicinal oil blended of pilchard oil and grayfish liver oil, was prepared on a commercial scale, and it may be noted that the demand for it is increasing steadily. The Pacific program also included valuable further study of the conditions necessary for successful refrigeration and storage and of the efficiency of refrigerated cars. Study of the Pacific salmon was continued, and at Ladysmith harbour a thorough investigation of factors influencing oyster growth was also made.

Educational work was also done by members of the board's staff, both east and west. At Halifax a course of instruction for fishermen was given, as well as a course for lobster cannery foremen. Members of the staff of the Fisheries Experimental Station at Halifax also delivered lectures in the course given by Dalhousie University leading to the degree of Bachelor of Science (Fisheries). In British Columbia a course of instruction for fishery inspectors was given at the Nanaimo Station and at Prince Rupert a series of lectures were given to members of the Fishermen's Union and members of the Halibut Vessel Owners' Association.

Further reference to the board's work will be found in Appendix No. 2 of this report, and a more detailed account is given in the annual report of the board itself.

### FISHING BOUNTY

During the year fishing bounties were paid to 12,836 claimants, the total payments amounting to \$159,311.35. This compares with 12,292 claims and \$159,780.65 in the year before. The authority under which this money is dis-



tributed among fishermen and owners of boats and vessels engaged in sea fishing on the Atlantic coast is "An Act to Encourage the Development of Sea Fisheries and the Building of Fishing Vessels" and each year the sum of \$160,000 is appropriated by the Governor in Council for distribution to those entitled to receive bounty. During 1933 there was \$72,920.85 paid to Nova Scotia claimants; \$24,455.90 to New Brunswick; \$11,518.90 to Prince Edward Island, and \$50,415.70 to Quebec.

The basis of distribution for last season was as follows:—

1. To owners of vessels entitled to receive bounty, \$1 per registered ton, payment to the owner of any one vessel not to exceed \$80.
2. To vessel fishermen entitled to receive bounty, \$6.10.
3. To owners of boats measuring not less than twelve feet keel, \$1 per boat.
4. To boat fishermen entitled to receive bounty, \$5.20 each.

Payments of bounty during the season 1933 were allotted as follows:—

To 576 vessels and their crews..... \$ 30,261 50

To 12,260 boats and their crews ..... 129,049 35

Details of the year's bounty distribution are shown in the following table:—

1933-34

Province and County	Boats	Men	Amount	Vessels	Tons	Average tons	Men	Amount	Total Amount
			\$ cts.					\$ cts.	\$ cts.
<b>NOVA SCOTIA—</b>									
Annapolis.....	165	288	1,662 60	.....	.....	.....	.....	.....	1,662 60
Antigonish.....	160	256	1,491 20	.....	.....	.....	.....	.....	1,491 20
Cape Breton.....	428	772	4,442 40	23	355	15	87	885 70	5,328 10
Cumberland.....	5	5	31 00	.....	.....	.....	.....	.....	31 00
Digby.....	451	809	4,675 80	.....	.....	.....	.....	.....	4,675 80
Guysborough.....	632	997	5,816 40	18	291	16	74	742 40	6,558 80
Halifax.....	981	1,333	7,945 60	48	603	12	177	1,632 70	9,628 30
Inverness.....	328	705	3,994 00	3	35	11	15	126 50	4,120 50
Kings.....	59	94	547 80	.....	.....	.....	.....	.....	547 80
Lunenburg.....	581	806	4,772 20	87	3,571	41	937	9,286 70	14,058 90
Pictou.....	21	29	151 00	.....	.....	.....	.....	.....	151 00
Queens.....	159	279	1,609 80	10	155	15	48	447 80	2,057 60
Richmond.....	494	942	5,393 65	4	62	15	13	141 30	5,534 95
Shelburne.....	704	1,291	7,417 20	25	731	29	227	2,115 70	9,532 90
Victoria.....	388	610	3,560 00	10	154	15	38	385 80	3,945 80
Yarmouth.....	165	402	2,255 40	13	413	32	152	1,340 20	3,595 60
<b>Totals.....</b>	<b>5,721</b>	<b>9,618</b>	<b>55,766 05</b>	<b>241</b>	<b>6,370</b>	<b>26</b>	<b>1,768</b>	<b>17,154 80</b>	<b>72,920 85</b>
<b>NEW BRUNSWICK—</b>									
Charlotte.....	313	564	3,267 80	2	28	14	10	89 00	3,356 80
Gloucester.....	527	1,248	7,016 60	215	3,606	17	958	9,449 80	16,466 40
Kent.....	181	327	1,881 40	8	84	10	18	193 80	2,075 20
Northumberland.....	53	115	651 00	54	584	10	129	1,370 90	2,021 90
Restigouche.....	25	50	285 00	.....	.....	.....	.....	.....	285 00
St. John.....	27	43	250 60	.....	.....	.....	.....	.....	250 60
<b>Totals.....</b>	<b>1,126</b>	<b>2,347</b>	<b>13,352 40</b>	<b>279</b>	<b>4,302</b>	<b>16</b>	<b>1,115</b>	<b>11,103 50</b>	<b>24,455 90</b>
<b>PRINCE EDWARD ISLAND—</b>									
Kings.....	299	423	2,498 60	3	62	20	11	129 10	2,627 70
Prince.....	617	1,207	6,893 40	1	18	18	3	36 30	6,929 70
Queens.....	180	340	1,961 50	.....	.....	.....	.....	.....	1,961 50
<b>Totals.....</b>	<b>1,096</b>	<b>1,970</b>	<b>11,353 50</b>	<b>4</b>	<b>80</b>	<b>20</b>	<b>14</b>	<b>165 40</b>	<b>11,518 90</b>
<b>QUEBEC—</b>									
Bonaventure.....	653	1,185	6,830 00	10	102	10	31	291 10	7,121 10
Gaspé.....	2,869	5,813	33,096 60	42	467	11	177	1,546 70	34,643 30
Matane.....	111	195	1,125 00	.....	.....	.....	.....	.....	1,125 00
Saguenay.....	684	1,314	7,526 30	.....	.....	.....	.....	.....	7,526 30
<b>Totals.....</b>	<b>4,317</b>	<b>8,507</b>	<b>48,577 90</b>	<b>52</b>	<b>569</b>	<b>10</b>	<b>208</b>	<b>1,837 80</b>	<b>50,415 70</b>
<b>Grand totals.....</b>	<b>12,260</b>	<b>22,442</b>	<b>129,049 85</b>	<b>576</b>	<b>11,321</b>	<b>19</b>	<b>3,105</b>	<b>30,261 50</b>	<b>159,311 35</b>



## PELAGIC SEALING

Canada's receipts under the Pelagic Sealing Treaty during the fiscal year amounted in all to \$52,466.26. Of this total, \$26,341.94 was the net return obtained by the Dominion from selling in London, England, a number of the seal skins delivered to by the United States under the provision of the treaty which entitles Canada to fifteen per cent, in number and value, of the seals taken annually on the Pribilof Islands by the United States. The balance of the total was made up of \$24,658.05 received from the United States as the Dominion's percentage of the net proceeds from the sale at St. Louis, Missouri, during 1933 of 50,587 Pribilof skins taken in other years, and \$1,463.57 paid by the Government of Japan as the net proceeds from the sale of Canada's share of the 1929 and 1930 takes of skins in the Japanese area coming under the treaty. The treaty provides that Canada is entitled to 10 per cent of the number and value of the total annual take of skins on Japanese sealing ground and in 1929 this take was 1,700 skins and in 1930 it was 1,720.

The Dominion's action in selling in London its share of the skins taken by the United States in 1933 was a departure from the practice followed for a number of years previously. Under the earlier practice the United States sold at St. Louis all of the skins taken on the Pribilofs from year to year and then paid to Canada and Japan, out of the net proceeds, the sums respectively due those two countries in the light of the treaty. This plan was followed by agreement. Canada came to the view several years ago, however, that while co-operative selling has obvious advantages it would be wise to have selling undertaken in other markets in addition to St. Louis, instead of having all the business centred in that city. Circumstances made it difficult to take immediate action to this end but this year Canada decided to market her share of the 1933 Pribilof kill in London. Arrangements were made accordingly. The United States delivered Canada's share of the skins—8,183 skins—at Seattle, without making any charge for transporting them to that port from the Pribilof Islands, and they were forwarded from there to Messrs. Lampson and Company, London, for marketing. Messrs. Lampson are the largest dealers in fur skins in Great Britain and in handling seal skins they work in conjunction with the two leading dyers—Rice and Martin.

It was thought best not to put all of Canada's skins on sale at the one time but 3,048 were offered in February, and with them four skins which the Dominion had confiscated in British Columbia. Of the 3,048 Pribilof skins which were put on sale 2,074 were in the salted or unfinished condition and 974 had been dressed and dyed. The four confiscated skins were unfinished. The total net return to the Dominion was \$26,344.64, and, as already noted, the skins which had come from Canada's share of the Pribilof kill accounted for \$26,341.94 of this amount.

*Sealing Off British Columbia.*—Under the treaty the Indians of the province are the only persons permitted to capture fur seals off British Columbia's coast and during the calendar year 1933 they took 1,984 skins, which had a marketed value of \$7,060. In the preceding year the number of skins taken by the Indians was 1,787 and the marketed value figures were \$4,885. Most of the seals captured in British Columbia waters are taken in Fisheries District No. 3, which is made up of Vancouver Island and the mainland coast opposite.

*Correction.*—Before closing this reference to sealing an error in the report for 1932-33 should be corrected. That report indicated that the take of skins on the Pribilof Islands in 1932 had been considerably smaller than the number landed in the previous calendar year. The correct figures for the two years were, in reality, much the same—49,524 for 1931 and 49,336 for 1932, a difference of only 188.

## INTERNATIONAL FISHERIES COMMISSION

During the past year, the International Fisheries Commission continued to perform its duties—the investigation of the life-history of the Pacific halibut and the observation and regulation of the fishery—as provided in the treaty of May, 1930, between Canada and the United States. The investigations added new information regarding the halibut and the fishery essential to successful regulation and proved that regulation has thus far continued to produce beneficial effects on the abundance of fish.

The 1933 fishing season was opened on February 1, two weeks later than in 1932. Despite the later opening and voluntary curtailment by part of the United States fishing fleet, the intensity of the fishery was so great that the season terminated earlier than in 1932. The quota for Area 2, which includes the coasts of British Columbia and Southeastern Alaska, was reached and the area closed at Midnight of August 25. Area 3 was closed to fishing on October 26.

*Contact with Industry.*—As in previous years, the commission maintained close contact with all branches of the halibut industry. Both formal and informal meetings were held with the Conference Board, composed of representatives from all sections of the fishing fleet. At these, the progress of the commission's investigations were explained, and the economic problems encountered by the fleet were discussed.

Of particular interest and importance to the fishing fleets during the past two years have been their efforts to distribute the landings of halibut throughout a greater portion of the year to enable the fishermen to obtain the maximum economic benefit from the fish taken. Voluntary curtailment was tried but proved only partially successful, due to failure of sections of the fleet to agree on a method of curtailment and to co-operate. During the past year the whole industry united in urging the commission to ask for authority to regulate the rate of landings so as to spread the catch over a longer season.

The abundance of fish, as indicated by the catch in pounds per unit of fishing, continued to increase during the year. The statistics of abundance show that the catch per unit of gear rose from 50.1 pounds in 1932 to 52.5 pounds in 1933, within Area 2, which includes the waters off the coast of British Columbia. The increase was much less than that occurring in each of the two preceding years, and there is no reason to believe that the catch will increase much more under existing limitations until sufficient time has elapsed to permit the maturation of a greater number of fish, which will, in turn, increase the production of spawn and of young fish.

In making any forecast of abundance it is necessary to take into account changes which have occurred in past years in the relative abundance of the parent stock. The records of the commission show that a great reduction occurred in the spawning stock of Area 2 between 1928 and 1931, as the result of an intense fishery for spawning fish in the spring of each year. It seems only fair to expect in 1934, and for several subsequent years, little or no increase in abundance but that a later renewed productivity will result from the rebuilding of the stocks which has been so apparent in 1932 and 1933.

The catch per unit of gear in the past year increased in Area 3, lying west of cape Spencer in Alaska, from 82.2 pounds to about 84.6. This also was a much smaller increase than those occurring in the two preceding years. Here, too, the effect of the present degree of restriction seems to be approaching its maximum. Minor fluctuations are expected from year to year, but there is no reason to expect much further increase.



The commission is vitally interested in the abundance of spawners present on the different banks, as an indication both of the condition of the stock on the banks and of the effects produced by regulation. Any permanent improvement in the condition of the stocks must be accompanied by a greater abundance of spawners and of spawning. The investigation of this problem has been the primary object of field work for several years including the past one.

The most rapid and economical method of determining the abundance of spawners and the success of spawning upon any bank would be to make a measurement of the abundance of eggs and larvæ in the region during the spawning season, by means of net hauls, if such a method were feasible. Using this method, the commission has made a general survey of the distribution of spawners along the coast, proving the abundance of spawning in Area 3 and its paucity in Area 2. A beginning of more exact work, by which any changes in the abundance of spawning on any bank or group of banks may be determined, was made in 1933.

The United States halibut schooner *Eagle* was chartered from the beginning of December to the latter part of March and operated off the coasts of northern British Columbia and Alaska. Operations were designed to determine more exactly the position at which the eggs float in the water and to examine the production of spawn in British Columbia waters, both as to immigration and as to local production. Net hauls were made at numerous appropriate stations and large quantities of plankton taken and preserved for examination in the laboratory. Until all this material is sorted and analyzed, a slow and tedious process, no definite conclusions may be attempted.

The results of a preliminary and necessarily cursory field examination of the material taken in the gulf of Alaska suggest that the amount of spawning from year to year may be more variable than was previously believed. In the gulf of Alaska, where in previous years they were taken in large numbers, eggs were comparatively scarce. Actual fishing trials confirmed this by showing that spawners were less abundant than usual.

*In British Columbia Waters.*—Operations in British Columbia waters were conducted during January and during early March. The January hauls were taken at the height of the spawning season when the number of locally produced eggs were presumably at their maximum. They form the basis for future comparison of the local production of spawn, and should be repeated from time to time. The late hauls, as in previous years, were made at a time convenient to study both local and immigrant larvæ since it was expected the latter would, if present, have by March drifted in from the western grounds. If, however, these hauls confirm the results of previous investigations by showing no young, future hauls at this time will be unnecessary.

In view of the expected increase in the abundance of spawners in southern waters as a result of the increase in the abundance of fish it is hoped that a greater number of eggs will be found in the hauls taken in British Columbia waters. A preliminary survey of the January hauls indicates that this may well be the case but final conclusions must await the sorting and analysis of the later hauls which are more strictly comparable with those of previous years.

During vessel operations, experiments were conducted relative to the rate of development of the halibut, information necessary for determination of the bank of origin of eggs and larvæ found drifting passively in the ocean currents. A small portable hatchery was placed on shore at Seward, Alaska, and supplied with eggs twice during the spawning season. These were incubated at the various temperatures to which halibut eggs are subjected in nature. None of the embryos survived to hatching and further development of technique is necessary. They were, however, carried part way, and the results obtained, if not complete, will be of great aid.



At the laboratory, the analysis of the landings of the fishery and the abundance of fish on the different banks was conducted and the study of such essential biological subjects as rate of growth, age at maturity, fecundity, early life history, distribution of spawning, drift of the pelagic young, and migrations of adults was continued. Market measurements of the halibut landed by the commercial fishery were begun as an aid in determining the changes produced in the stocks of fish by the fishery and by regulation. All phases of the investigation supplied additional knowledge bearing on the need, application, and results of regulation.

The commission's progress in the investigation and regulation of the halibut fishery has been very satisfactory. Its investigations have explained the changes which occurred in stocks in the past and those occurring at present, and have provided a proper basis for observation and for action. Its regulations have already markedly increased the stocks on both western and southern grounds, though those on the latter cannot yet be said to be in a sound condition.

### PASSAMAQUODDY COMMISSION

The International Passamaquoddy Fisheries Commission, established by Canada and the United States, jointly, to investigate the probable effects which damming of Passamaquoddy and Cobscook bays would have upon the fisheries of that region, completed its work early in the fiscal year and in due course submitted its report to the two governments. The report was based upon data obtained through studies carried on by several highly qualified scientists employed under the commission and in considering the data, as well as in formulating the plans for the investigation and observing how they were carried out, the commissioners had the assistance of an honorary Advisory Council made up of two recognized fisheries scientific experts from the United States and two from Canada.

The findings of the four commissioners—Henry O'Malley and O. E. Sette, representing the United States, and Doctor A. G. Huntsman and the undersigned, representing Canada—are set out in the report as follows:—

"The investigators, with the counsel of the Advisory Board, have reported that they anticipate that construction of the proposed dams would practically extinguish the herring fishery inside the dams; that the fishery in the adjacent area outside the dams (Quoddy Area) would be affected to an unknown degree, either adversely or favourably; and that there appears little probability of the dams affecting the fishery along the coast of Maine or even seriously of Grand Manan. During the years 1930 and 1931 the commercial herring catch for Passamaquoddy and Cobscook bays inside the proposed dams formed 2·5 per cent; and areas outside the dams, from St. Mary bay, N.S., to cape Elizabeth, Maine, 97·5 per cent of that for the whole region.

"It must be recognized that the results of the investigation do not explain the unusual richness of the herring (sardine) fishery both inside the dams and outside, and without an elucidation of the uniqueness of the area, it cannot be concluded that the projected dams might not so alter the environment as to seriously affect the results of the fishery. Facing a problem in fishery biology unlike any that has heretofore been solved, investigators highly competent in their respective fields, examined many factors suspected of directly influencing the fishery. They have contributed results that greatly increase the understanding of the present circulation, the production of phyto- and zooplankton, and the nature of the herring concentration in the region. The investigation of forces beyond these, that determine the existence of the fishery, requiring the development of new methods, has not been possible in the limited time available.

"It is well known that marked concentration of the weir fishery for herring (sardine) in the Passamaquoddy region exists and although the herring does not spawn in the immediate region, it is generally regarded as an important nursery ground for the species. As the investigations have not revealed the causative factors among the particular phenomena that have been studied in the fields of herring biology, zooplankton, phytoplankton, and hydrography, it is clear that other factors, at present unknown, may be responsible for this concentration of young herring.

"Without a knowledge of the factors concerned in the concentration, prediction of the entire effect of the dams on the fishery cannot safely be made. The commission therefore finds that:—

"1. The weir fisheries for young herring inside the bays, which produce 2.5 per cent of the total annual catch, would be very greatly reduced by the construction of the dams.

"2. Without further investigation, which the commission is not in the existing circumstances in a position to conduct, the extent of the effect upon the fisheries outside of the passages to the bay by the Cooper dams cannot be foretold."

#### NORTH AMERICAN COUNCIL ON FISHERY INVESTIGATIONS

The work of the North American Council on Fishery Investigations, which is an international body representative of France, the United States, Newfoundland and Canada, is entirely of a co-ordinating nature, since the council administers no funds whatever, and is, therefore, unable as a body to carry on any investigations. Co-ordination is accomplished largely through the exchange of information and the expression of common policy in resolutions at an annual meeting.

In 1933 the twentieth meeting was held at the Atlantic Biological Station of the Biological Board of Canada, St. Andrews, New Brunswick, on September 13 and 14. The Biological Board through this station carries on the Canadian investigations on the Atlantic coast, which it is attempted to co-ordinate with those of other countries having fishery interests in the northwestern Atlantic. The chairman of the council, Dr. H. B. Bigelow, Director of the Woods Hole Oceanographic Institution and one of the representatives of the United States, presided over the meeting. The United States was also represented by another member, Mr. Elmer Higgins, of the Bureau of Fisheries, and by three advisers, including Mr. O. E. Sette, who has charge of the Atlantic fishery investigations conducted by the Bureau of Fisheries. Dr. Harold Thompson, Director for the Newfoundland Fishery Research Commission, represented that country. France was unrepresented. Canada was represented by Dr. Wm. A. Found, Deputy Minister of Fisheries, Dr. J. P. McMurrich, Chairman of the Biological Board of Canada, and Dr. A. G. Huntsman, Director of the Atlantic Biological Station, as well as by a number of advisers, consisting principally of investigators on the staff of the station. Dr. E. E. Watson attended the meeting as an adviser, representing the investigators of the International Passamaquoddy Commission, whose problem has been continuously under review by the council from the time it became a matter of international concern.

The council at times sponsors certain publications, one on the mackerel fishery by Mr. O. E. Sette being presented for this purpose to the meeting of 1933. Accounts of the proceedings of the council are being published triennially, the next one to cover the period from 1931 to 1933.

This council co-operates with the European International Council for the Exploration of the Sea, Dr. E. LeDanois, of France, being a member of each



body, and the latter body giving a standing invitation to its meetings to representatives of the North American Council. Efforts are being made, not only toward concerted action in matters of common concern, but also toward joint publication of data and of summaries of work.

The general character of the work reviewed by the North American Council will be evident from the following accounts of certain of the investigations which are in progress:—

*Haddock Investigations.*—The United States, Canada, and Newfoundland are studying various aspects of the fishery and biology of the haddock, of which there is a somewhat common stock on the offshore banks, and also near the coast at certain seasons. Haddock show increasing numbers of vertebrae and of gill rakers going from cape Cod to Halifax, but it is not yet known whether or not this actually means distinct races and stocks of haddock. Those on the Grand bank are found to grow at a rather slower rate than those on the Nova Scotian banks. It has been known for some time that fluctuations in the abundance of our haddock are in part due to failure or exceptional success of breeding in particular years. The 1928 year class has come to predominate over other year classes in the stock on the Grand bank, while the 1929 year class is now the most abundant one on Sable Island bank and on Georges bank. Haddock of this year class were found to cross the deep Fundian channel from Georges to Browns bank in March and April of 1933, which is the first direct evidence of a mass movement across that channel.

*Cod Investigations.*—The United States finds that while cod found in summer off cape Cod migrate southwestward to the New Jersey coast in winter, those on the Maine coast exhibit no well-defined seasonal migration, although a certain proportion emigrate as they grow older, chiefly to Nova Scotian waters. There is some indication that the shore waters of Maine form an important nursery, which furnishes a large part of the offshore stock of adult cod.

The Canadian work shows that the summer low level in monthly landings of cod from the vicinity of Halifax, which low level does not seem to occur either off Lockeport or off Canso, represents an actual drop in catch per unit of gear. This occurs in the warm upper layer, the cold intermediate layer, and the warm deep layer, although the fish in the upper layer differ from those of the other two layers in having fewer vertebrae, gill rakers and fin rays, which is seemingly indicative of different stocks of fish.

Newfoundland has established a definite correlation between the age of cod and the vitamin A content of the liver oil, the younger fish having lighter coloured oil, low in vitamin A content. Accordingly, light-coloured oil is not to be considered as indicating a better oil, and, in fish of the same size, those that have grown slowly, as occurs in more northern waters of the coast, will yield liver oil with higher vitamin A content.

*Herring Investigations.*—Study by Canada has shown that the immature herring of the Passamaquoddy region exhibit rather constant differences in fatness, even between places but a few miles apart. These differences are found to be related to the abundance of copepods ("red feed") and Euphausiids ("shrimp"), and particularly to the extent to which these are near the surface and thus available to the herring at all times. On the other hand, this availability is found related to deep tidal mixing, which concentrates the food organisms as well as bringing them toward the surface from their usual deep water habitat. Inflow of large volumes of fresh water into the sea, as occurs during spring freshets, is found to bring about a concentration of the herring at the places of deep tidal mixing, and weirs suitably located for taking



advantage of this have the reputation of being "spring weirs." The fish seem to be carried to the mixing point in the layer of surface water made light through the addition of fresh water.

*Hydrological Investigations.*—Conditions in the water are seen as primarily responsible for the varying character of the individual fisheries, whether the variations are seasonal, annual, or of longer period, or even of irregular character. These conditions are being studied by the fishery research services of the various countries, and by international organizations, as well as by private institutions. The International Ice Patrol has collected data for the Grand bank, and for the waters between Labrador and Greenland. Newfoundland follows the changes in the waters off its east and south coasts. The St. Lawrence Biological Station of Laval University is studying the estuary of the St. Lawrence river. The Biological Board of Canada is following conditions off the outer coast of Nova Scotia from Halifax as a centre. The United States Bureau of Fisheries has been doing special work on Georges and Browns banks. The International Passamaquoddy Fisheries Commission has completed a two years' study of the hydrography of the bay of Fundy and of the adjacent part of the gulf of Maine. The Woods Hole Oceanographic Institution, which has been attempting to determine conditions between Bermuda and the American coast, is now studying intensively certain of the conditions in the gulf of Maine.

Your obedient servant,

WM. A. FOUND,  
*Deputy Minister of Fisheries.*

## APPENDIX No. 1

### ANNUAL REPORTS OF CHIEF SUPERVISORS OF FISHERIES FOR THE YEAR 1933

#### REPORT OF MAJOR D. H. SUTHERLAND, CHIEF SUPERVISOR OF FISHERIES, EASTERN DIVISION

The division comprises the provinces of Nova Scotia, New Brunswick, Prince Edward Island and the Magdalen Islands of Quebec. The value of the fisheries of this area for the year 1933 was \$10,266,474 as compared with \$10,914,282 for the previous year. Marketing conditions were unfavourable and low prices prevailed throughout the year. The catch, however, was in excess of that of last year, and there were 391,754,600 pounds of fish and shellfish landed, as compared with a catch of 346,733,600 pounds in 1932.

The lobster fishery again proved the mainstay of the inshore fishermen, and the marketed value of the catch far exceeded that of any other fishery. The quantity of lobsters taken, however, was considerably less than that landed during the previous year, and consequently the marketed value suffered a corresponding decline.

The total annual marketed value of all fish landed throughout the division during the past six years was as follows, the term "fish" being used as including shellfish:—

1933.....	\$ 10,266,474
1932.....	10,914,306
1931.....	13,680,034
1930.....	17,026,070
1929.....	19,334,431
1928.....	18,524,697

#### THE LOBSTER FISHERY

The total catch for 1933 was 37,012,100 pounds, having a marketed value of \$3,482,424, as compared with a catch of 47,852,100 pounds and \$4,704,241 for the previous year. Decreased catches were shown throughout the division, the province of Nova Scotia showing the heaviest decline. The total pack of canned lobsters for the year was 120,771 cases as against a pack of 164,981 cases during 1932. It had a total value of \$1,893,066 as compared with \$2,677,350 for the previous year. The following table shows the catch, pack and shell shipment with marketed values, by provinces, for the past three years:—

#### CATCH

	1933		1932		1931	
	Cwts.	Marketed Value	Cwts.	Marketed Value	Cwts.	Marketed Value
		\$		\$		\$
Nova Scotia.....	176,858	1,884,715	237,730	2,711,371	223,649	2,725,620
New Brunswick.....	74,940	830,363	98,722	1,041,845	94,988	1,376,257
Prince Edward Island.....	91,547	591,801	114,570	750,039	94,150	754,542
Magdalen Islands.....	26,776	175,545	27,499	200,986	20,241	155,415
Totals.....	370,121	3,482,424	478,521	4,704,241	433,028	5,011,834

## QUANTITY SHIPPED IN SHELL

	1933		1932		1931	
	Cwts.	Marketed Value	Cwts.	Marketed Value	Cwts.	Marketed Value
	Cwts.	\$	Cwts.	\$	Cwts.	\$
Nova Scotia.....	84,271	1,087,770	99,527	1,418,178	96,793	1,500,883
New Brunswick.....	27,286	348,473	37,777	471,288	39,046	738,225
Prince Edward Island.....	9,568	71,253	3,549	29,277	19,501	189,956
Magdalen Islands.....	589	3,611	2,300	18,400	.....	.....
Totals.....	121,714	1,511,112	143,153	1,937,143	155,340	2,429,064

## QUANTITY CANNED

	Cases	\$	Cases	\$	Cases	\$
Nova Scotia.....	50,729	754,590	74,060	1,245,654	65,617	1,189,587
New Brunswick.....	26,417	454,424	35,490	537,991	34,476	627,860
Prince Edward Island.....	32,895	512,138	44,490	711,119	37,055	683,247
Magdalen Islands.....	10,730	171,914	10,941	182,586	8,340	155,359
Totals.....	120,771	1,893,066	164,981	2,677,350	145,488	2,656,053

## TOMALLEY

	Cases	\$	Cases	\$	Cases	\$
Nova Scotia.....	2,432	18,988	2,624	19,415	3,754	51,139
New Brunswick.....	236	1,825	190	1,486	107	1,222
Prince Edward Island.....	1,032	6,905	939	8,323	815	8,255
Magdalen Islands.....	4	20	.....	.....	22	161
Totals.....	3,704	27,738	3,753	29,224	4,698	60,777

## THE COD FISHERY

The cod fishery shows an increase of 9,789,900 pounds in the catch, \$77,438 in the landed value and \$197,874 in the marketed value. Increases were general throughout the division. The total catch amounted to 112,255,000 pounds, having a landed value of \$1,084,625 and a marketed value of \$1,802,026 as compared with a catch last year of 102,465,100 pounds having a landed value of \$1,007,187 and a marketed value of \$1,604,152.

## THE HADDOCK FISHERY

There was a decrease in the haddock fishery. The catch for the year was 26,879,600 pounds, having a landed value of \$331,202 and a marketed value of \$831,934, as compared with a catch of 36,018,500 pounds for the previous year, with a landed value of \$507,375 and a marketed value of \$1,114,802. The catch decrease, which amounted to over 9,000,000 pounds, is accounted for by the smaller landings in Nova Scotia. Landings in New Brunswick showed a slight increase, with a substantial increase in the marketed value.

## THE HERRING FISHERY

The herring fishery showed a considerable increase in the catch as well as in the landed and marketed values. The catch totalled 82,649,600 pounds and



it had a landed value of \$317,421 and a marketed value of \$776,686, as compared with a catch of 67,870,500 pounds, with a landed value of \$288,998 and a marketed value of \$591,346 for the previous year. There was quite a marked increase in the catch in New Brunswick. Increases were shown in Nova Scotia and Prince Edward Island but a decrease in the Magdalen Islands.

#### THE SALMON FISHERY

The catch of salmon was 3,100,500 pounds, having a landed value of \$308,194 and a marketed value of \$400,604 as against a catch of 2,688,600 pounds, having a landed value of \$257,797 and a marketed value of \$333,281 for 1932. The usual heavy fall run of salmon was maintained in the Miramichi river and the tributaries. There was a slight increase in catch in Prince Edward Island.

#### THE SMELT FISHERY

There was a considerable decrease in the return from the smelt fishery. The catch for the year amounted to 6,936,700 pounds, with a landed value of \$324,514 and a marketed value of \$432,518, while in 1932 the catch amounted to 8,877,800 pounds and it had a landed value of \$341,552 and a marketed value of \$650,530.

#### THE MACKEREL FISHERY

There was a very considerable increase in the catch of mackerel in the division, largely as a result of heavy catches made in Nova Scotia where landings were almost double those of the preceding year. The catch totalled 26,234,600 pounds, having a landed value of \$211,750 and a marketed value of \$394,215, while in the preceding year the catch amounted to 17,620,100 pounds, landed value to \$159,756 and marketed value to \$272,058. Very low prices prevailed for this fish throughout the year and therefore while the catch shows a considerable gain the landed and marketed values do not show corresponding increases.

#### OTHER FISHERIES

Increases are shown in the landings of sardines, swordfish and scallops. The sardine catch amounted to 26,022,400 pounds, having a landed value of \$113,228 and a marketed value of \$622,531, while in the year before only 13,347,800 pounds were taken and they had a landed value of \$44,340 and a marketed value of \$426,399. The catch of swordfish was 1,713,700 pounds, having a landed value of \$117,602 and a marketed value of \$208,038 as compared with 1,035,900 pounds, with a landed value of \$39,432 and a marketed value of \$99,585 in the previous year. The bulk of the swordfish landings are made off Cape Breton. A tremendous increase is shown in scallop fares for the year. All told 85,464 gallons (shelled) were taken. Their landed value was \$159,958 and the marketed value \$160,410. In 1932 there was a catch of 44,384 gallons (shelled) which had a landed value of \$69,253 and a marketed value of \$73,293.

#### NOVA SCOTIA

The amount of fish landed in Nova Scotia during 1933 was 215,521,700 pounds. Its landed value was \$3,405,902 and marketed value \$6,010,601. The comparative figures for 1932 were 195,713,600 pounds, a landed value of \$3,856,255, and a marketed value of \$6,557,943.

The table given below shows, by species, the landings of the principal commercial fish taken during 1933, together with landed and marketed values and comparative figures for 1932:—

	1933		
	Catch	Landed Value	Marketed Value
	lbs.	\$	\$
Lobsters.....	17,685,800	1,223,980	1,884,715
Cod.....	86,603,300	852,643	1,442,599
Haddock.....	25,495,400	313,881	799,218
Mackerel.....	20,970,600	171,125	306,049
Herring.....	20,149,500	119,017	290,803
Halibut.....	2,790,000	220,988	287,547
Swordfish.....	1,713,700	117,602	208,038
Scallops (shelled).....	61,500	118,813	119,265
Salmon.....	824,500	82,938	111,066
Hake and cusk.....	8,822,900	26,821	84,032
Smelts.....	682,900	44,382	66,558
Pollock.....	3,324,900	13,311	31,523
	1932		
	Catch	Landed Value	Marketed Value
	lbs.	\$	\$
Lobsters.....	23,773,000	1,780,026	2,711,371
Cod.....	79,598,400	794,002	1,282,082
Haddock.....	34,706,900	487,630	1,086,343
Mackerel.....	10,701,900	107,367	170,082
Herring.....	15,519,000	106,752	231,971
Halibut.....	2,269,600	176,403	254,840
Swordfish.....	1,035,900	39,432	99,585
Scallops (shelled).....	38,974	61,824	65,864
Salmon.....	867,900	89,647	113,518
Hake and cusk.....	8,599,400	28,868	84,307
Smelts.....	918,600	62,337	101,597
Pollock.....	5,942,000	30,313	48,563

The chief varieties showing increases are cod, mackerel, herring, halibut, swordfish, scallops, and hake and cusk. The lobster fishery and the haddock, salmon, smelt and pollock fisheries were less successful than in 1932.

The lobster catch for the province for the past six years has been as follows:—

	lbs.
1933.....	17,685,800
1932.....	23,773,000
1931.....	22,364,900
1930.....	20,820,100
1929.....	19,003,500
1928.....	17,240,900

#### SPORT FISHING

Nova Scotia with its numerous lakes, rivers and streams affords excellent sport for the angler which is enjoyed by the residents of the province and numerous visitors or tourists. The waters of the province are free to all and Nova Scotia's fame as a sport fishing country attracts many visitors. The sport fisheries, such as salmon and trout, constitute a distinct economic asset and attract more and more sportsmen each year.

*Angling in Cape Breton.*—It is gratifying to report that 470 salmon were landed in the Margaree river, Cape Breton, in 1933 as compared with 167 in 1932. This was the best season on the Margaree since 1928, with the exception of 1931 when 484 salmon were taken. Salmon entered the river about June 15. The water was high and dark about that time and the fish continued to ascend until the latter part of the month. It is a remarkable fact that many of the fish did not delay for any length of time in the pools but kept straight on to the



headwaters. Although the water became low and clear in July and August, the catch was fairly good and there was a large run after the freshet of September 8, which resulted in satisfactory catches being taken from that date until the end of the season. Tourists were fairly well pleased with the fishing and several of them took upwards of 20 salmon during the season.

The run of salmon in Little river was larger than in 1932, and the fish started to ascend about the 1st of June and increased in numbers towards the middle of the month. All anglers who visited the upper part of the stream in the latter part of June enjoyed good fishing, and several fish weighing over 25 pounds each were caught. When the streams became low in the latter part of July and August fly fishing ceased for a time, but in September the river rose and there was an average run of fish, a few being taken by anglers. The total number landed during the season was 116, as compared with 62 in 1932. The increased catch was due to the fish having been more plentiful on the coast early in June than was the case in 1932.

The total number of salmon landed with the fly in the North river, Victoria county, was 74 as compared with 37 in the previous season. Salmon entered the river about June 3 and the first fish was taken on June 7. Catches were landed almost every week after the first school entered the river. A large run entered in July and as many as 65 salmon were seen in the pool above the falls. A great improvement has been noted in fishing since the blasting of the falls a few years ago; salmon are ascending in much larger numbers and this river consequently is becoming very valuable from a fisheries standpoint.

Salmon did not enter Middle river, Victoria county, until the fall freshets and consequently angling conditions were favourable only for a few days.

In Grand river, Richmond county, only 19 salmon were landed as compared with 30 in the previous year. The decrease is attributed to low water conditions.

Trout fishing in the tidal waters of the Margaree river was poor in May, but good catches were taken at Margaree forks and the Northeast Margaree in June and July, some of the fish weighing four and five pounds. Trout were not so plentiful at the Southwest Margaree as during the 1932 season.

The May runs of trout in the tidal waters of Little river, Cheticamp, were not as large as in former years, but in July and August the fish were reported plentiful. The number taken in the river was 173 as compared with 160 in the previous year.

There were 779 fish taken in Pleasant Bay streams, an increase of 464 over the number landed in 1932. The increase in the catch is explained by the fact that these streams were visited by a larger number of local and outside anglers than was the case in the previous year.

Fairly good trout fishing was had at Indian river, Whycocomagh, during May and June and part of July, and the catches taken in lake Ainslie were much better than for several years. Trout of good size and quality appeared in these waters about June 12 and another large run entered in July. It is eight or ten years since trout have been so plentiful in these waters. Some of the trout that entered lake Ainslie in July were of poor quality, but the run that came in towards the end of the month were fresh from the sea and of good quality and size, and good catches were landed until the end of the season.

The catch of trout in Grand river and loch Lomond was slightly better than in the previous year.

Angling for trout in the Mira river, Cape Breton county, showed a marked improvement, the fish taken being, on the average, larger than formerly. Many of them weighed over four pounds. It is thought that the planting of fry in the tributaries of the Mira river over a period of years can be given a large measure of credit for the improved angling.

Although more trout were taken in Catalone lake than were in 1932, the catch was below the average for the past few years. Cold and unseasonable



weather during the time when fishing is usually at its best in these waters no doubt accounts for the small catch, as apparently trout had ascended the Twelve Mile river before conditions were favourable for angling in Catalone lake.

Fairly good catches were taken in Meadows brook, Indian brook, Gillis brook, Mill brook, Benacadie pond and river and Leitches and Balls creek.

Good catches were taken in North Aspy river in the last two weeks in June and July. At Warrens brook good catches were made in May, and satisfactory catches were taken in Clyburn's brook in August. At Ingonish river and Corson's brook there was good fishing during the latter part of June and in July.

*On the Eastern Mainland.*—Angling was fairly good in the eastern section of the mainland until about the middle of July. In Halifax county the trout fishing was good in the western area but not as good as in 1932 in the eastern section. The western part of Guysboro county had good angling in the streams and lake to about July 15 and good sea trout fishing from August 15 to the close of the season. In Guysboro east, trout fishing was not up to normal, owing to low water, sea trout being considerably less plentiful than usual. Trout angling in Antigonish county was average in April and May but poor from that date onward. Good angling obtained in Pictou County East, especially in the lakes stocked by the Fish Culture Branch, which also was the case in Cumberland county. Angling in Hants and Colchester counties was good during May but less satisfactory in June. There was good bass fishing in Grand lake. Generally in Hants county, the low water condition was unfavourable to angling.

Salmon angling in Halifax county was, on the whole, much the same as in 1932. In Halifax west the number of fish taken was only eighty-five, compared with 150 in 1932, but in Halifax east 600 were taken, as compared with 500 for the year previous. The best salmon angling was obtained in Ingraham, Osier and Nine Mile rivers in Halifax west and in Musquodoboit river, Tangier, Ship Harbour, Sheet Harbour rivers, Quoddy and Moser rivers in Halifax east.

In Guysboro county west salmon angling was not so good as in 1932. The catch by rivers in each of several recent seasons was:—

	1933	1932	1931	1930	1929
St. Marys river.....	127	104	305	245	.....
Gaspereaux brook.....	12	8	15	22	.....
Ecum Secum river.....	32	35	75	75	.....
Country Harbour river.....	3	5	21	16	.....
Liscomb river.....	14	15	18	.....	.....
Totals.....	188	267	434	358	614

The decrease in catch, as compared with 1929 landings, does not appear to be due to scarcity as large numbers of salmon could be seen in the rivers but would not take the fly.

In Guysboro east twenty salmon were taken by angling, compared with twelve in 1932, the largest being nineteen pounds. These fish were all taken in Cole Harbour waters.

About seventy-five salmon were taken by fly fishing in river Philip and Wallace river, Cumberland county.

The speckled trout fry planted in Harts lake, Cumberland county, has resulted in making very good angling there, and in the lakes and streams stocked there is a decided improvement generally.

Rainbow trout plantings in Grants lake have been successful to the extent that it is proposed to allow fishing there in 1934.

Mention should be made of the establishment of rearing ponds at Waverley, Halifax county, by the Nova Scotia Fish and Game Protective Association. These ponds, at the head of Grand lake, are for the purpose of retaining sport fish fry until they attain a size which will insure that a larger percentage of them will survive and mature than would be the case if the smaller size were used for stocking. The project has been financed by public subscription supplemented by a grant from the Provincial Government. Some technical advice and assistance was given the association by the department. Nine ponds have been constructed, each 90 feet long, with the necessary caretaker's buildings, ice-houses, etc. The water supply is obtained from a dam constructed on Waverley brook, and when necessary, a further supply is available from Rawdon river. It is understood that it is proposed to construct a further number of retaining ponds at this place when money is available.

*On the Western Mainland.*—In the western section of the province the anglers for salmon were not as fortunate as in some previous years. However, it appears that trout fishing improved and good catches were made.

#### FISHERY PATROL SERVICE

In addition to a number of small boats owned by various inspectors, four regular patrol boats were employed during the year in connection with the protection and supervision of the fisheries.

The *Thresher* was in commission throughout the year, except for a short period covering the annual overhaul of her engine. She patrolled 8,927 miles. The district covered extended from the lobster boundary line at river Philip, Cumberland county, to Shelburne county. The service rendered by this boat in protection work was very satisfactory indeed and her work was instrumental in keeping down illegal fishing.

The *Mildred McColl* was commissioned on April 19 and was on duty until November 11, when she was laid up at Pictou. The *McColl* did patrol work in Northumberland strait, off northern New Brunswick, and in Prince Edward Island areas. A total of 3,833 miles was patrolled during the period of operation.

The *Capelin* patrolled the waters of the bay of Fundy throughout the year. Her services were very satisfactory and it is believed her work was instrumental in preventing illegal fishing in the area covered by her, extending from Pubnico to the headwaters of the bay.

The *A. Halkett* left Halifax on April 12, patrolling westward and making headquarters at Shelburne where she was engaged until June 6. Later, she proceeded to carry on scallop investigation work in the waters of Prince Edward Island and Richmond county, Cape Breton. At the end of August the boat was sent to carry on similar investigation in the vicinity of Grand Manan, N.B., afterwards returning to Nova Scotia waters to carry on regular patrol.

#### FISHERY PROTECTION SERVICE

C.G.S. *Arras* and C.G.S. *Arleux*, the former under the command of Captain Clement Barkhouse and the latter commanded by Captain H. P. Cousins, were engaged throughout the year in fisheries protection work.

During January, February and the greater part of March the *Arras* was employed in southwestern Nova Scotia in lobster protection work, breaking ice in harbours for the relief of fishermen, and patrolling. From March 21 to May 5 the vessel was laid up at Liverpool, undergoing annual overhaul, protection work being resumed upon repairs being completed. On June 12 she proceeded to the Grand Banks with the Nova Scotia fishing fleet, and returned early in September.



The captain reports: "We had more sickness this last season than usual. The water was very cold on the banks, which the doctor says caused so much illness. The sudden change from our home waters upset the crews. We had 364 men for treatment, who were given treatment 687 times, and also six men for hospital treatment."

While the ship was on the banks weather, bait and ice conditions were broadcast twice daily to vessels of the fleet. On her return from the banks at mid-August the *Arras* was engaged in general fisheries protection work. The ship steamed 11,716 miles and spent 187 days at sea.

The *Arleux* during the first two weeks in January was engaged as a "mother" ship to the winter haddock fishing fleet at Canso, Petit de Grat and vicinity and on January 16 patrolled the coast to Halifax. The ship was laid up for annual overhaul at Lunenburg from January 23 to March 13. On completion of overhaul the vessel took up protective work in southwestern Nova Scotia waters. From April 29 until May 9 the ship was engaged in protective work in Northumberland strait, and then returned to western Nova Scotia. From then on her time was divided between patrolling the waters of western Nova Scotia, including the bay of Fundy, and Northumberland strait and work in connection with the swordfishing fleet in the vicinity of Louisburg and Scatarie. She was again engaged from November 25 to December 31 as a "mother" ship to the haddock fishing fleets of Canso and Petit de Grat. During the year the *Arleux* rendered assistance to fishing vessels and boats and assisted navigation by keeping the harbours open during the winter months. The ship steamed 9,358 miles and spent 136 days at sea. In addition, the auxiliary motor boat belonging to the ship was engaged in inshore patrol work and covered 530 miles.

#### BAIT AND ICE REPORTING SERVICE

The daily fisheries broadcast service was resumed on April 1 and continued until November 25.

By means of this service the fishing fleet and others interested in the fishing industry were kept informed with regard to bait and ice conditions, etc. The service is of great value, particularly to the fleet operating on the Grand Banks. The information was collected from all parts of Nova Scotia and the Magdalen Islands by telegraph and telephone by the Halifax office of the department, and broadcast twice daily from the Louisburg Marconi Station and the Halifax Lightship.

The C.G.S. *Arras*, which is equipped with a wireless transmitter, also furnished the fleet on the banks with information as to bait and ice conditions, etc.

#### THE LUNENBURG FLEET

In 1911 the Lunenburg fleet of 122 vessels landed 216,000 quintals of salt fish, an average of 1,774 quintals per vessel. In 1926, fifteen years later, 92 vessels landed 342,730 quintals, an average of 3,725 quintals per vessel. This was the peak and the catch was valued over \$2,000,000. From 1928 the results by years, have been as follows:—

	Vessels	Quintals	Average per vessel  quintals
1928.....	75	225,700	3,009
1929.....	71	208,700	2,939
1930.....	68	142,380	2,091
1931.....	46	94,400	2,052
1932.....	26	72,600	2,769
1933.....	26	80,900	3,111



On the "frozen baiting" trip 15 vessels landed 8,250 quintals in 1933. On the "spring" trip 24 vessels landed 23,300 quintals and on the "summer" trip 26 vessels landed 49,350 quintals. One vessel, the *Douglas Mosher*, was lost on the Newfoundland coast during the year's operations.

#### LOBSTER TRANSPORTATION SERVICE

The subsidized service arranged by the department in 1930 to carry shipments of live lobsters from Eastern Nova Scotia points to Boston and Gloucester, Mass., was again operated in 1933. During the year 11,690 crates were carried by the boats engaged in this service, while in 1932 the shipments amounted to 11,601 crates.

The following table will show the summary of shipments by ports:—

#### 1933—LOBSTER COLLECTION SERVICE

	Crates Collected		Net Weight lbs.
	Large	Small	
St. Peters.....	234	123	47,400
Arichat.....	672	59	106,700
Petit de Grat.....	3,136	1,553	625,700
Queensport.....	65	5	10,250
Canso.....	1,430	417	256,200
Dover.....	670	35	104,000
Whitehead.....	870	43	134,800
Port Felix.....	733	559	165,850
Coddles Harbour.....	396	50	64,400
Fisherman's Harbour.....	261	2	39,350
Drum Head.....	256	121	50,500
Totals.....	8,723	2,967	1,605,150

NOTE.—Lobsters landed at Arichat, Petit de Grat and St. Peters from Northern Cape Breton points on independent collection service and then carried forward to Massachusetts on the boats operating under the departmental arrangement, are included in this statement.

The service was well patronized and gave further proof of its usefulness to the fishermen.

#### PROSECUTIONS

During the year there were fifty-one prosecutions for violation of the fishery regulations. Seven took place in District No. 1, twenty-four in District No. 2 and twenty in District No. 3.

#### CONFISCATIONS

During the year 228 confiscations were made—thirteen in District No. 1, ninety-six in District No. 2 and one hundred and nineteen in District No. 3.

#### NEW BRUNSWICK

There was an increase in the landings of fish in New Brunswick during the year. The total quantity landed was 129,995,200 pounds having a landed value of \$1,618,842 and a marketed value of \$3,061,152 as compared with a catch of 101,754,900 pounds, a landed value of \$1,505,203 and a marketed value of \$2,972,682 in 1932.

Increased catches were made in the sardine, herring, salmon, cod, alewife, hake, haddock and scallop fisheries.

The chief commercial catches during the year with their respective marketed and landed values were as follows:—

	1933		
	Catch	Landed Value	Marketed Value
	lbs.	\$	\$
Lobsters.....	7,494,000	514,579	830,363
Sardines.....	26,022,400	113,228	622,531
Herring.....	48,371,200	153,885	390,088
Smelts.....	5,244,400	246,961	315,485
Salmon.....	2,340,800	235,779	299,326
Cod.....	13,905,300	139,378	209,997
Alewives.....	4,925,500	17,115	55,812
Hake and Cusk.....	8,061,800	21,729	57,042
Oysters.....	2,032,400	36,485	46,906
Haddock.....	1,340,400	16,853	31,048
Scallops (shelled).....gals.	23,964	41,145	41,145
	1932		
	Catch	Landed Value	Marketed Value
	lbs.	\$	\$
Lobsters.....	9,872,200	611,051	1,041,845
Sardines.....	13,337,800	44,290	426,349
Herring.....	36,927,300	113,938	244,737
Smelts.....	6,838,300	238,569	492,888
Salmon.....	1,902,300	180,799	232,412
Cod.....	13,388,400	138,682	197,917
Alewives.....	3,170,200	10,941	34,839
Hake and Cusk.....	3,483,400	13,376	41,657
Oysters.....	2,491,000	38,345	48,794
Haddock.....	1,251,800	18,241	25,706
Scallops (shelled).....gals.	5,410	7,429	7,429

There was a sharp decrease in the catch of lobsters in the bay of Fundy waters of the province, and decreased catches were also made on the North shore.

On the other hand, the returns from the important sardine fishery were much better than they had been in 1932. As the figures show, the catch increased by almost 100 per cent and value totals rose substantially. The herring, hake, and salmon fisheries were also much more productive than in the preceding year. The hake catch more than doubled. The gain in herring landings could have been made even greater than it was, had market conditions been more favourable, as during the spring there was a tremendous run of these fish on the North shore. As is seen from the table, New Brunswick's cod fishery was also somewhat more successful than it had been in 1932. The cod gains were made in spite of a decrease in the landings from the bay of Fundy areas.

The betterment in the scallop fishery returns was a feature of the year. The catch reached record figures—23,964 gallons, shelled as against only 5,410 gallons in the year before—with marketed value showing an increase of more than \$34,000. The oyster fishermen, however, did not do so well as in 1932, so far as size of catch was concerned, but improved prices prevented any very substantial decrease in value returns. Another of the fisheries of the province to show less satisfactory results than in the preceding year was the smelt fishery.

*Inland District.*—There was a substantial decrease in the commercial catch in the inland district of the province, and a decrease in marketed value. The year's catch was 4,682 hundredweights, with a marketed value of \$27,702, while in 1932 the catch was 6,595 hundredweights and its value on the market was \$36,750.

#### SPORT FISHING

The Restigouche and its waters still hold first place among the angling waters in the province, about 3,000 salmon being taken there in three months of 1933, mostly by non-resident anglers. The Nepisiquit also had a good year with approximately 400 salmon being taken but this river furnished much better grilse fishing. Only ten non-residents were reported fishing on the Nepisiquit.

In Northumberland county angling for spent salmon in the spring by special permit was carried on quite extensively for the first time on the Tabusintac river.

In other waters of the district trout fishing is the main sport fishery, but fishing was not as successful as in 1932.

In the inland district there was an increase in the angling catch. More anglers were on the rivers, lakes and streams than in the previous year.

#### PATROL BOAT SERVICE

The usual patrol services, maintained by the *Phalarope* and *Gannet Rock*, were carried on during the year. In addition to fishery patrol duties both of these boats, when called upon to do so, convey sick persons from both Grand Manan and Campobello to St. Stephen for treatment. The *Mildred C.* and the *Ethel M.* again performed very valuable services, both in connection with the enforcement of the size limit for lobsters during the open season, as well as in preventing illegal fishing during the close season.

In the eastern section of the province five chartered boats were used in patrol work, two of which were later called for service elsewhere in the division, while the two division boats the *Mildred McColl* and the *Arras* operated for a time. The vigilance of the crews of these boats, co-operating with inspectors and guardians on the shore, kept close check on illegal fishing during probably the most trying year in recent times. It is gratifying to note that the work of the crews of the boats has the approval of the large majority of the fishermen and the people generally.

#### PROSECUTIONS

There were 94 prosecutions for violation of the fishery regulations during the year. Eight took place in District No. 1, 51 in District No. 2, and 35 in District No. 3.

#### CONFISCATIONS

During the year 453 confiscations were made—38 in District No. 1, 321 in District No. 2 and 94 in District No. 3.

#### PRINCE EDWARD ISLAND

The total Prince Edward Island catch for the year was 22,347,300 pounds with a landed value of \$519,165 and a marketed value of \$842,315. In 1932 the catch amounted to 23,736,800 pounds, having a landed value of \$713,552 and a marketed value of \$988,919.

The following table shows the chief commercial varieties taken, with the landed and marketed values of the catches:—

	1933		
	Catch	Landed Value	Marketed Value
	lbs.	\$	\$
Lobsters.....	9,154,700	396,248	591,801
Cod.....	3,642,900	27,879	65,021
Herring.....	5,061,000	26,383	63,852
Smelts.....	920,800	29,136	46,040
Oysters.....	1,328,600	21,582	37,431
Mackerel.....	925,500	8,870	21,472
Hake and Cusk.....	864,600	3,772	8,092
Salmon.....	14,700	1,470	2,205
Clams and Quahaugs.....	244,000	1,116	2,049



	1932		
	Catch	Landed Value	Marketed Value
	lbs.	\$	\$
Lobsters.....	11,457,000	551,731	750,039
Cod.....	3,559,400	36,030	52,405
Herring.....	4,543,600	46,681	68,246
Smelts.....	1,032,200	36,611	51,610
Oysters.....	1,174,600	17,623	24,329
Mackerel.....	607,700	11,616	18,260
Hake and Cusk.....	738,000	4,681	7,636
Salmon.....	13,400	1,975	1,975
Clams and Quahaugs.....	400,200	2,023	8,435

## COD

As the table shows, there was an increase of 835 hundredweights in catch and in the marketed value a gain of \$12,616. Fish were plentiful, but the prices offered the fishermen were extremely low and, as a result, there was little effort made on the part of the fishermen to engage intensively in this fishery.

## HADDOCK

There was a decrease of 160 hundredweights in haddock landings and a decrease in the marketed value of \$1,085. Haddock are always in good demand locally and the total catch was disposed of fresh.

## HAKE

Hake were very plentiful during the greater part of the season between Miminegash and cape Bear, but as there was no outside demand for them, only a sufficient quantity was taken for local consumption. Total catch increased by 1,266 hundredweights and marketed value by \$456.

## HERRING

There was an increase in the herring catch of 5,174 hundredweights but a decrease in the marketed value of \$4,394. The spring catch was absorbed as lobster bait and fox food. Some 600 barrels of fat fall herring were caught and were disposed of locally at fair prices.

## MACKEREL

There was very little outside demand for mackerel. With the exception of 200 barrels of fat fall fish which were exported to the United States, the total catch was absorbed by local markets. The fall fish were caught in Northern Kings county.

## SMELTS

Smelt catch decreased by 1,114 hundredweights, and marketed value by \$5,570. Two-thirds of the total catch was taken in the Hillsboro river and its tributaries. Smelts were scarce in Prince and Kings counties throughout the season. The frozen smelts were graded to meet the requirements of the Boston and New York markets, and as a result fairly good prices were obtained.

## LOBSTERS

The season opened about fifteen days later than in 1932 on account of prevailing ice conditions. To this fact, and unfavourable weather conditions which prevailed during the remainder of the month of May, may be attributed

the decrease of 23,023 hundredweights in the catch. Another factor contributing to the decrease was the difficulty in obtaining sufficient bait before the end of May. The catch in the late season district, which opened on August 16 and closed on October 15, also shows a considerable decrease as compared with the catch of 1932.

#### OYSTERS

The entire oyster catch which increased by 1,540 hundredweights was disposed of at fair prices, and marketed value increased by \$13,102. If winter conditions had not prevailed during the month of November, the catch would have been much greater than it was. All oysters exported from this province were inspected by an inspecting officer, and it would appear, from reports received from the wholesale buyers in Montreal and other marketing centres that the quality of the oysters was superior to that of any previously shipped. A quantity of oysters was shipped to Quebec, Montreal and Toronto from private beds in Richmond bay and fancy prices were received for them. It will be but a matter of a few years when the shipments from Richmond bay will be greatly increased as the lessees of oyster grounds are developing their areas very rapidly, and it is expected that many of these lessees will be shipping next fall. Oysters will also be shipped next fall from the leased areas in Savage harbour and Covehead. East and West rivers and their tributaries, and Vernon, Seal and Orwell rivers are well stocked with small oysters and no doubt will yield the usual catch during the coming season.

#### SPORT FISHING

In Kings county a marked increase was reported in the catch of trout. In Southern Kings and Queens counties trout fishing was good throughout the season. In Northern Queens fishing was reported better than in 1932 and increased catches were made in the following streams: New Glasgow, Granville, Wheatley, Winter, Point de Roche pond and Wisner's dam. Fishing in West Prince was fully as good as in other years while reports from East Prince indicate fairly good trout fishing.

Rainbow trout fishing in O'Keefe's lake was a disappointment, but there was excellent fishing in Glenfinnan lake throughout the season. Although Afton lake was stocked with rainbow fry some years ago, no trout have been caught in this lake up to the present.

#### PATROL BOAT SERVICE

Six patrol boats were engaged during the season to prevent illegal lobster fishing—two in West Prince, one in East Prince, two in Queens county, and one in Kings county. The C.G.S. *Arras*, after her return from the banks, rendered patrol assistance during the fall lobster fishing season. Due to the efficient work of the boats employed, illegal lobster fishing was kept down to a minimum.

#### PROSECUTIONS

There were thirty-six prosecutions during the year.

#### CONFISCATIONS

Ninety-two confiscations were made during the year.

#### THE MAGDALEN ISLANDS

The total catch in the Magdalen Islands in 1933 was 23,890,400 pounds with a landed value of \$253,407 and a marketed value of \$352,406, as compared with 25,528,300 pounds, a landed value of \$237,197, and a marketed value of \$414,290 in 1932.

The chief varieties landed by the Magdalens' fishermen and their landed and marketed values in the two years were as shown below:—

	1933		
	Catch	Landed Value	Marketed Value
	lbs.	\$	\$
Lobsters.....	2,677,600	135,895	175,545
Cod.....	8,103,500	64,725	84,409
Mackerel.....	3,526,000	20,588	44,268
Herring.....	9,067,900	18,136	31,943
Smelts.....	88,700	4,035	4,435
Clams.....	402,000	2,010	2,010
Eels.....	10,000	500	500
Halibut.....	7,200	338	338
	1932		
	Catch	Landed Value	Marketed Value
	lbs.	\$	\$
Lobsters.....	2,749,900	139,061	200,986
Cod.....	5,918,900	38,473	71,748
Mackerel.....	4,607,800	23,038	58,053
Herring.....	10,880,600	21,627	46,392
Smelts.....	113,500	4,540	5,675
Clams.....	1,236,600	6,183	6,414
Eels.....	12,000	600	600
Halibut.....	9,000	360	450

#### COD

Cod were plentiful on all parts of the coast during the entire season. The catch increase was 21,846 hundredweights. Marketed value increased by nearly \$11,900.

#### HERRING

Herring, always the first fish to make their appearance around the coast of the Magdalen Islands, are used principally for lobster bait and for smoking purposes, but as the prices offered for smoked herring were very low, only two smoke houses operated in 1933. It is expected, however, that there will be a much larger quantity smoked during the season of 1934. The 1933 catch and value were less than in 1932, as the table shows.

#### MACKEREL

There was a decrease in the mackerel catch of 10,818 hundredweights, and a decrease in the marketed value of \$13,785. It was very difficult to dispose of these fish and the fishermen, who had to be content with very low prices, scarcely paid overhead expenses.

#### SMEELTS

Smelt catch decreased by 248 hundredweights and marketed value by \$1,240. Smelts caught in the Magdalen Islands run large and usually command a fair price.

#### CLAMS

There was a decrease of 8,346 hundredweights in the clam catch and a decrease in the marketed value of \$4,404. Clams were used principally as codfish bait.



## THE DIVISION GENERALLY

## ILLEGAL FISHING

Due to the efforts of the permanent officers, in co-operation with the Royal Canadian Mounted Police, and others, illegal fishing was generally kept at a minimum. A number of honorary guardians were appointed by the department and their work was effective. Provincial game wardens also assisted in the suppression of poachers. Unemployment conditions, of course, tended to promote illegal fishing but by the efforts of the officers of the department and others rendering assistance, infringement of the regulations was kept in check.

## INSPECTION OF CANNERIES AND CANNED FISH

The lobster canneries and other processing establishments were inspected by the officers of the department. In cases where the canneries did not come up to the standard they were advised that they would not be allowed to operate. There was a marked improvement with regard to sanitary and equipment conditions. Due to educational work that has been carried on during the past few years, resulting in close co-operation between the cannery and the officers of the department, there was a general improvement in the output.

## INSPECTION OF PICKLED FISH CONTAINERS, FISH CURING ESTABLISHMENTS AND EDUCATIONAL WORK

Under the capable divisional direction of Supervisor R. Gray, inspection work was carried on throughout the year. From June 12, 1914, until May 31, 1933, systems of inspection of pickled fish containers, pickled alewives, pickled mackerel, pickled herring, hard cured smoked round herring, oysters, fish curing premises and curing utensils were conducted which set those interested thinking, with the result that compulsory inspection was requested and put into force on June 1 last.

Prior to that date local conferences of supervisors and inspectors were held at Newcastle, N.B., Charlottetown, P.E.I., Digby, Truro and Sydney, N.S., at which the changes in the regulations made under the Fish Inspection Act were explained. Stencils and other equipment, for use in connection with inspection work, were issued and demonstrations given as to their proper use.

Before 1933, January to the end of May was considered an "off" season as far as the inspection of containers and fish was concerned but during that period of 1933, 395 visits were made for educational purposes. Three hundred and fifty-four fish curing premises and the utensils used in connection therewith, were inspected as to cleanliness and 4,161 empty pickled fish containers, 1,861 barrels of alewives, 227 barrels, 10 half-barrels and 5 pails of herring, 717 barrels, 1 half-barrel and 7 pails of mackerel, 80,575 18-lb. boxes and 1,400 2-lb. boxes of hard cured smoked round herring and 522 barrels of oysters were inspected during those months.

From the 1st of June until the 31st of December, 1,639 educational visits were made and 2,088 fish-curing premises, 67,950 empty containers, 5,718 barrels of alewives; 58,314 barrels, 181 half-barrels and 56 pails of mackerel; 16,079 barrels, 6,262 half-barrels and 704 pails of herring; 137,009 18-pound boxes of hard cured smoked round herring; 9,665 barrels and 1,460 boxes of oysters were inspected.

In the year, as a whole, the packages inspected included 72,111 empty containers, 7,579 barrels of alewives, 59,031 barrels, 182 half-barrels and 63 pails of mackerel, 16,306 barrels, 6,072 half-barrels and 709 pails of herring, 219,584 18-lb. boxes and 1,400 2-lb. boxes of hard cured smoked round herring, 10,217 barrels and 1,460 boxes of oysters, or a total of 394,714 packages, while 4,476 visits for educational purposes and inspections as to cleanliness were made.

Owing to an abnormal run of small mackerel this spring, it was found necessary to create a grade for fish of this type and at a meeting of the fish trade held in Halifax on July 13 it was decided to ask the department to allow those small fish to be known as "Small Medium" counting from 226 to 300 to a barrel of 200 pounds. This was agreed to.

#### MARKETING CONDITIONS

Marketing conditions were very difficult throughout the year and demand was slack. Prices generally were low. The spring price for canned lobsters was low but advanced later on in the season. The price received for pickled herring was almost below the cost of production and there was little demand for "tropical" fish.

#### UNITED MARITIME FISHERMEN

The United Maritime Fishermen, which is mainly concerned with the affairs of the shore fishermen of the Maritime Provinces and the Magdalen Islands, rounded out its fifth year of activity with an annual convention at Moncton, N.B., during the latter part of October, all former conventions having been held at Halifax. In addition to the Executive Committee there were in attendance directors from the twelve zones into which the territory covered is divided and a large number of delegates representing active locals of the association in many parts of the Maritimes. Reports presented went to show that the different activities entered into had been well maintained.

A number of regional conventions were called during the year to discuss matters of local as well as of general interest.

A healthy increase in the number of co-operative lobster canneries, which offer unusual opportunity for group effort, and their successful operation, would seem to justify amply the policy of the United Maritime Fishermen in promoting such enterprises. The promotion of co-operation canneries, however, is but one of the numerous phases of activity undertaken. Considerable attention is being directed towards the co-operative production and marketing of salt fish and other finished fish products. In marketing live lobsters the U.M.F. local groups have been able to conduct their operations in such a manner as to benefit to a much greater extent than would ever have been possible under former individualistic methods. Co-operative buying of cannery supplies, rope, twine, lines and other items of fishing equipment in large quantities by U.M.F. groups has resulted in numerous savings, and, it is understood, will continue to be one of the most important features of the association's activities.

The Central Office, located at Halifax, houses the records of the association and renders valuable service to local groups in connection with producing and marketing. It also publishes a monthly paper, which has a circulation of 5,000 copies and has been increased in size from time to time to meet the demands made upon it for advertising space by leading manufacturers, distributors of fishing supplies and marketing agencies.

It is gratifying to know that it is the policy of the United Maritime Fishermen to lend its support to all proper steps for the regulation and conservation of the valuable fisheries in which its members engage and to encourage its members to take advantage of such instructional facilities as are offered by the department from time to time through the different mediums under its control.

The 1935 convention of the association will be held in Charlottetown, P.E.I.

#### LOSS OF LIFE

During the year seven fishermen in the division lost their lives while performing their duties, three in Nova Scotia and four in New Brunswick.



# ANNUAL REPORT OF CHIEF SUPERVISOR OF FISHERIES (MAJOR J. A. MOTHERWELL) WESTERN DIVISION (BRITISH COLUMBIA) FOR 1933

Due to more favourable market conditions the intensity of salmon fishing and the incentive to put up large packs was increased materially during the year under review. The carry-over from the previous seasons had been fairly well cleared up and the indications at the first of the year appeared to point to a better demand for most varieties.

The total pack of all varieties for the whole province amounted to 1,265,072 cases, compared with a total of 1,081,031 cases for the preceding year, 685,104 cases for 1931, and 2,221,783 cases in 1930.

Such comparisons are always somewhat misleading, due to the fact that packs depend largely on the market conditions, which, in turn, fluctuate from year to year. For instance, in the case of chum salmon, in 1931 the total pack was only 55,977 cases, compared with an average during recent years of well over 400,000 cases. In the case of pinks, the pack in the same year amounted to only 206,995 cases, compared with 477,969 cases in the brood year. The reduction in the total salmon pack for 1931 was practically all due to the lack of demand for these two varieties specially mentioned.

The following statement shows the average total pack of all varieties of salmon canned in British Columbia covering the past fifteen years, arranged in five-year groups:—

1919-1923.....	1,163,265 cases
1924-1928.....	1,785,882 "
1929-1933.....	1,330,743 "

## SOCKEYE

The most valuable variety of salmon is the sockeye, for which a ready market is always available, providing it has been well packed. The total pack for the calendar year 1933 was 258,107 cases, compared with a total of 281,306 cases for 1929. The following statement covering the period of the past fifteen years gives the average pack arranged in five-year groups:—

1919-1923.....	303,805 cases
1924-1928.....	322,162 "
1929-1933.....	318,582 "

In the southern part of the province the life cycle of the sockeye differs somewhat from that of the northern runs. For instance, in the Fraser river, the streams on the west coast of Vancouver island, the Nimpkish river and other sockeye areas south of Queen Charlotte sound, the returning parent fish are practically all four years old, although there are some few individuals three, five and even six years of age on their return to the spawning grounds. The farther north, however, the greater the percentage of the older fish and for this reason it is difficult to compare from year to year, or even in year groups, the runs to any particular section. In one year, for instance, the percentage of five-year old fish in the Skeena would be greater than the four-year olds and in other years the reverse would be the case. This applies in a number of the northern areas.

*Naas River.*—The total of sockeye salmon caught in this area produced 10 173 cases, compared with 16,347 cases in 1929 and 5,558 cases in 1928, the fish in this area being predominantly four and five years of age.

Whilst the runs to the Naas have heretofore been more or less of an uncertain factor, it is felt that this has been largely due to the variation in the intensity of operation of fishing gear in the way of traps in the area north of the



international boundary as it has been proven that some portions at least of the run of sockeye to the Naas pass through this northern fishing area. With the recent curtailment of traps in the waters above mentioned, together with the reasonably satisfactory spawning reports, there is some justification for expecting that the run of sockeye to the Naas will be at least well maintained in future.

*Skeena River.*—The pack in this area amounted to only 27,693 cases, compared with 77,714 cases in 1929 and 34,524 cases in 1928, four and five-year fish predominating in this area also. Undoubtedly some unusual action will be necessary to preserve the run and the proper attention will be given to this matter in the recurring cycle years.

It was hoped that with the lowering of the upper boundary on the river recently some improvement would be observed in the returns but this year's pack gives no encouragement.

Undoubtedly the weather conditions, unusually difficult even for the Skeena river, and the fact that the fishermen did not commence to operate until later than usual, resulted in a better escapement to the spawning grounds than might have been expected from the quantity caught.

In the way of conservation measures, the deferring of the opening date for fishing or the advancing of the closing time would not bring the desired effect since the heart of the run would receive no additional protection.

The increasing of the weekly closed period is a more desirable method in view of the fact that a reasonable percentage of each tribe would be permitted to escape upstream but from the standpoint of the industry the longer idle periods each week, as a result of the increased closed time, would preclude profitable operations.

There seems to be no doubt but that in the years 1937 and 1938 some unusual measures will require to be adopted with a view to taking care of the situation and it is quite probable that what fishing is permitted in those years will be confined to areas well outside the river.

*Rivers Inlet and Smiths Inlet.*—The total pack of sockeye resulting from catches at these areas amounted to 119,548 cases, compared with 79,548 cases in 1929 and 93,361 cases in 1928. The situation in these two inlets is most satisfactory for, notwithstanding the large catch, there was an abundant supply left for the spawning grounds.

*Fraser River.*—The total pack of sockeye caught in the Fraser River district amounted to 43,745 cases, compared with 54,717 cases in the brood year of 1929.

Probably a more informative comparison would be by the use of the total packs of sockeye from the runs proceeding to the Fraser river, which includes the catches of the traps on the southwest coast of Vancouver island and the fishing gear on the United States side of the international boundary. These figures show a total pack for 1933 of 178,204 cases, compared with 175,743 cases for the brood year of 1929, the Fraser run being composed mainly of four-year fish.

The year 1933 is the cycle of what was at one time a very large run of sockeye to the Fraser river. Each cycle year, of course, the industry rather expects that the run may have produced an increased quantity of the excellent variety which established the reputation of British Columbia salmon in the world markets. There have been indications from time to time which have given some cause for hope that the up-river portion of the run, which is the most valuable, was increasing but it is difficult to arrive at a definite conclusion, although in the Chilcotin district conditions have been decidedly encouraging.

There was no late run of sockeye to the Fraser area during the year such as was experienced in the cycles of 1930 and 1931.

## SPRINGS, BLUEBACKS AND STEELHEADS

Whilst there is considerable fluctuation in the packs of these varieties, compared with other years, yet, as previously stated, the pack is no indication of the quantity taken since these varieties, apart from the bluebacks, are mostly processed by other methods than canning.

## COHOES

The total coho pack of 137,289 cases is a fairly satisfactory one and probably could have been increased if the incentive had been greater. This is one variety for which the market demand has lagged somewhat. The supply along the coast, generally speaking, was unusually good during the year.

The following statement covering a period of the past fifteen years gives the average pack in five-year groups:—

1919-1923.....	121,964 cases
1924-1928.....	155,746 "
1929-1933.....	139,478 "

## PINKS

Due to the unusual demand created by the allotment to Canada by the French authorities of a quota for canned salmon, increased efforts were made to pack both pinks and chums. The total pack for the year of 532,558 cases of pinks compared with 206,995 cases for the brood year. This comparison, however, is hardly a fair one in view of the failure of the pink run at one particular point in the north in the 1931 season and the lack of demand during the two years preceding that under review.

The following statement shows the average pink packs for the past fourteen years arranged in two-year groups:—

1920-1921.....	356,881 cases
1922-1923.....	511,455 "
1924-1925.....	551,480 "
1926-1927.....	510,305 "
1928-1929.....	635,165 "
1930-1931.....	659,466 "
1932-1933.....	378,137 "

## CHUMS

The pack of 293,630 cases this year compares with 306,761 cases for the preceding year, 55,997 cases in 1931 and 401,114 cases in 1930. In connection with the figures for 1931, however, it is to be remembered that there was little demand in that season for canned chums, and that led to a small pack.

The chums are a late-running variety of salmon and arrive, usually, when the rainy season has commenced. The year under review has been an unusually rainy one and on the arrival of the chums the streams were in flood condition and the fish passed up quickly and in small numbers instead of schooling about the mouths as usual waiting for water conditions to be suitable.

The following statement shows the average packs for the past fifteen years arranged in five-year groups:—

1919-1923.....	240,866 cases
1924-1928.....	661,145 "
1929-1933.....	296,496 "

## FREEZING OF SALMON

A feature of the salmon industry in this province during the year was the extension of the freezing of salmon. Cold storage facilities at Vancouver, New Westminster, Victoria, Butedale and Prince Rupert were utilized and consider-

able quantities were exported to European and Oriental markets. Indications would appear to justify the expectation that this business will be increasing in future. The principal varieties used are the springs, steelhead, cohoes and chums. Some pinks are also used.

#### SALMON—STRIKE OF FISHERMEN

Production by means of salmon trolling was curtailed somewhat, due to a strike of the fishermen operating off the west coast of Vancouver island.

The United States fishermen, who troll in considerable numbers off the coast of Washington and British Columbia, were not satisfied with the prices they were obtaining from the Seattle buyers and refused to fish. In sympathy with these people the Canadian operators on the west coast of Vancouver island also remained in port from May 8 to June 16, when satisfactory marketing arrangements were completed.

#### SALMON EXPORTS

Whilst the following figures showing the exports of canned salmon from the port of Vancouver since 1921 do not represent the total shipment from British Columbia, yet the figures will be found of considerable interest. The increase in 1933 exports is largely due, of course, to the French quota, which permitted the export of an unusually large quantity of canned fall salmon to the French market.

Year	Total Exports	Year	Total Exports
1921.....	939,823 cases	1927.....	1,322,597 cases
1922.....	794,344 "	1928.....	1,344,868 "
1923.....	929,289 "	1929.....	1,331,204 "
1924.....	1,525,542 "	1930.....	1,021,640 "
1925.....	1,571,004 "	1931.....	979,787 "
1926.....	1,254,304 "	1932.....	944,806 "
	1933.....		1,134,689 cases

#### SALMON—QUALITY

In view of the intensely keen competition in foreign markets for canned salmon the question of quality has become of paramount importance; as a matter of fact, intimation was received to the effect that if Canadian canned salmon was to receive the requested preference in the British markets it would be necessary that steps be taken to maintain a high standard of quality.

Among other measures adopted in 1933 for the purpose of raising and maintaining the quality, salmon purse seining was permitted for the first time in that portion of the gulf of Georgia which lies between the Fraser river and the international boundary on the south.

In each odd-numbered year there is a very large run of pink salmon to the Fraser river and the streams in that vicinity. These salmon on their way to the Canadian waters pass through those of Puget sound and run the gauntlet of hundreds of salmon traps and salmon purse seines before passing across the boundary into Canadian territory. During their passage through the waters to the south of the international boundary these salmon are in prime condition, but, unfortunately, after they arrive in Canadian waters they play about in the fresh and brackish water off the mouth of the Fraser river for weeks and they become more and more unsuitable for canning purposes. When they finally decide to pass into the river their condition is such as to result in a canned product which is far from being a credit to Canadian packers.

It is estimated that approximately seventy-five per cent of the catches of pink salmon running to the Fraser district is made by the operators to the south of the international boundary when the fish are in good condition but the Canadian operators, previous to the allowing of purse seines in the lower part of the gulf of Georgia, were enabled to take only the remaining twenty-five



per cent of the total catch and the majority of these were really of inferior quality for canning so that what should have been a very profitable run of salmon from the standpoint of the Canadian fishermen has been of little or no value to Canada whereas, on the contrary, this run has been a very valuable one to the operators of another country although the fish were hatched on the spawning grounds of Canadian streams.

It is interesting to note that for the year under review there were packed in the United States from Puget Sound waters 543,340 cases of pink salmon, practically all of which were taken from the runs proceeding to Canadian waters. The pack of the same variety by Canadian operators in the Fraser River district amounted to only 96,394 cases.

Whilst the total quantity of pink salmon packed in the Fraser district amounted to 143,058 cases, there were 46,664 cases brought in from other districts, which left the above mentioned total (96,394 cases) of canned pinks taken from the runs from which the operators to the south of the international boundary were able to obtain over one-half million cases in good condition.

Of the 96,394 cases of canned Fraser River district pinks, 43,390 cases were captured by means of gill-nets.

After examination by the Canned Salmon Inspection Board 11,652 cases of gill-net-caught pinks were classified as Grade 2 and not entitled to the usual quality certificate whereas only 211 cases of seine-caught fish were so classified, the others being all graded as entitled to a first class certificate.

The following extracts from a communication received from the Canned Salmon Inspection Board regarding this year's pack of pink salmon in the Fraser River district will be found of interest:—

"The opening of waters off the Fraser to seining would appear to have led to a much improved quality in respect to a large portion of the pack at Fraser River canneries and canneries in the Vancouver area packing so-called Fraser River pinks. The individual experience of each member of the board, over a long period of years, has been that the great bulk of the Fraser pink pack has been of such a character that under the inspection now in force it would have to be classed as second quality for lack of firmness. It was only the very early portion of the pack that would have been approved. This season it has been evident that a large part of the catch came from outside waters, having firmness and colour never evident in pinks gill-netted in the fresh water of the river. . . . .

" . . . . . The pack of Fraser pinks in 1929, which was the last year when they were packed in quantity, consisted of 161,529 cases. The result of the packing of that fish was a demoralization of the market and a loss of prestige for British Columbia pink salmon, one of the results being that in 1931, which was the next cycle year when pinks came into the Fraser, there were packed only 20,000. If the pack of 1929, consisting of 161,529 cases, had been submitted to the inspection system now in vogue the board considers it safe to say there would have been at least 100,000 cases degraded to second quality. . . . .

" . . . . . The bulk of the pinks packed in British Columbia this season has already been sold, there being a good market demand, and what is being delivered, instead of besmirching the reputation of Canadian salmon as did the Fraser pack of 1929, will raise it and the consuming centres will be in a receptive mood for subsequent packs."

In certain cycles there is a late run of sockeye salmon which acts in a manner very similar to the pink runs described above. These sockeye also play about in the fresh and brackish waters between the Fraser river and the international boundary until they are in poor condition for canning.

The area in which the purse seining is now permitted in the southern part of the gulf of Georgia is that in which little gill-netting has been done in the past and it has been proven that it is impossible to take any reasonable quantity of these pinks and "late run" sockeye in good condition by means of gill-nets whereas, on the contrary, the purse seines are able to capture considerable quantities of these fish in first-class condition before they have had an opportunity to deteriorate in quality. In this way there is made available to the industry a supply of first-class salmon which otherwise would be of very little, if any, value to the Canadian industry.

Another effort by the department in the way of raising the standard of quality of British Columbia salmon was a regulation under the Meat and

Canned Foods Act requiring that no certificate of inspection of canned salmon be issued for salmon that had not been landed fresh at a cannery for canning within twenty-four hours after being caught, excepting such fish as had been gutted and iced immediately after being caught. In connection with this regulation, however, it has been found that it is impossible of complete enforcement, although the object to be gained in the way of raising the quality certainly well justified the year's attempt.

#### FRENCH QUOTA FOR CANNED SALMON

The trade agreement between Canada and France of May 12, 1933, provided for a quota of 25,000 metric quintals of canned salmon to be shipped from Canada to France up to September 25 and that this quantity would be granted a special tariff. Later, under the same agreement, a further quota of 74,670 metric quintals was arranged for, with shipment between October 1, 1933, and November 30, 1934.

Under the two quotas there was shipped up to December 31, 1933 a total of 85,040 quintals, which leaves 14,630 quintals for shipments which it is expected will be made during January, February and March of 1934.

Each parcel required a separate Certificate of Origin issued by the Chief Supervisor of Fisheries at Vancouver and visaed by the French Consul at the same city. The number of such certificates issued up to December 31, 1933, totalled 718.

The two quotas were responsible for a longer salmon fishing season as the shipments to France were largely composed of pinks and chums, and these species, the chums particularly, run late into the fall of the year. Another result of the quota was the ability of the Canadian packers to market the considerable packs of the fall varieties promptly, which was quite a new experience in recent years.

#### INSPECTION OF CANNED SALMON

With the exception of two seasons in the inspection of British Columbia canned salmon there can be no room for doubt that the inspection service has been immensely successful and has resulted in raising the quality of British Columbia canned salmon very materially. The few minor difficulties, which were natural during the first season, have been adjusted and the regulations are working quite smoothly.

The following statement shows the operation of the inspection regulations during the year:—

Number of inspections made.....	2,962
Total number cases inspected.....	1,440,957
Total number cases rejected.....	19,838
Total number cases available for certificates.....	1,421,119
Total amount of fees paid.....	\$ 14,246.45

#### DETAILS OF CANNED SALMON INSPECTIONS BY SPECIES

Species	Number of cases inspected	Number of cases rejected	Number of cases available for certificates
Sockeye.....	277,823	2,066	275,757
Springs.....	44,467	134	44,333
Steelheads.....	1,463	.....	1,463
Bluebacks.....	21,854	108	21,746
Cohoe.....	160,160	957	159,203
Pinks.....	541,170	15,193	525,977
Chums.....	394,020	1,380	392,640
Totals.....	1,440,957	19,838	1,421,119



## PARTICULARS OF NON-CERTIFIED CANNED SALMON BY SPECIES

Species	Below 2nd Quality	Second Quality	Tips and Tails	Totals
Sockeye.....	12	684	1,370	2,066
Springs.....	31	103		134
Blueback.....		10	98	108
Cohoe.....		873	84	957
Pinks.....	888	14,305		15,193
Chums.....	293	1,087		1,380
Totals.....	1,224	17,062	1,552	19,838

## HALIBUT

The halibut landings in British Columbia during the year totalled 170,372 hundredweights, compared with 168,847 hundredweights in the previous year. Of these, 82,799 hundredweights were landed by Canadian boats and 85,573 by United States boats. The number of Canadian boats operating out of British Columbia was 76.

On the advice of the International Fisheries Commission the regulations were altered to permit halibut fishing to commence on February 1 instead of January 16 as in the previous year.

The total catch which it was felt might be permitted during the year was placed at 46,000,000 pounds; 21,700,000 pounds of this was allotted to Area 2 and 24,300,000 pounds to Area 3.

It was found as the season progressed that, owing to intensive fishing operations, the quotas would be reached well before the closing time of November 15 and it became necessary to close fishing in Area 2 at midnight August 25 and in Area 3 at midnight October 26.

With a view to spreading the fishing season over as long a period as possible, consistent with profitable operations, the United States fishing boats arranged amongst themselves for a plan of curtailment of fishing whereby, as conditions made such action desirable, the fishing boats were required to remain in port for certain periods between trips. This arrangement appeared to work reasonably satisfactorily to the fishermen but was not entirely successful, due to the fact that the Canadian boats did not agree to inclusion in the arrangement mentioned. The Canadian operators continued to fish without lay-ups and had a definitely more profitable season than otherwise would have been the case.

On the whole, the prices were a little better than those of the previous year and the halibut fishermen generally were considerably encouraged.

The saving of halibut livers for use in the manufacture of medicinal oil was, again found to be profitable, the quantity landed at British Columbia ports during the year being 2,864 hundredweights valued at \$54,611.

## HERRING

The year's drysalt herring pack totalled 513,024 hundredweights, compared with 269,420 hundredweights in the previous year. The 1932 pack, however, had been the smallest since 1919, but not because of a lack for fish, for, on the contrary, there were ample supplies of herring available, but to marketing conditions in the Orient which made it unprofitable to take larger catches for dry-salting.

In 1933 an attempt was made to get together in one organization all those interested in the production of drysalt herring in British Columbia. It was felt, for a time, that these efforts were meeting with success but as the season advanced some members withdrew from the arrangement made, with the result



that competition became so great, and the methods of marketing were so diversified and unprofitable, that it was found necessary by the industry to curtail fishing again. It is felt that if the industry could succeed in some method of co-operation there are possibilities for an extremely profitable business each year in British Columbia drysalt herring.

The northern catch was not so great during the year, owing to the fact that as a result of the reduction plant at Prince Rupert not operating there was a material decrease in the demand. There is no suggestion, however, that there was any scarcity of herring in the northern area.

#### PILCHARDS

For some reason which is not definitely known the pilchard run to British Columbia waters this season was practically a failure. Whilst small catches were obtained they were mostly all from distances of from fifty to sixty miles to the south off the coast of the state of Washington. The transportation of these fish, which were very fat, over such great distances under weather conditions which are often difficult in this area was found to be unprofitable and the fishermen were obliged to cease operations.

As the season advanced and the fish did not appear on the usual fishing grounds the fishermen appealed to the Fisheries Department for assistance and the C.G.S. *Givenchy* was sent for a patrol of three days (August 3 to 5) to the south and westward for the purpose of locating any schools. None were found, however, and the boat returned to her usual patrol.

On August 9 the C.G.S. *Malaspina* was sent out with four captains of the pilchard fleet and in a patrol covering ten days (to August 18) searched the area from the Columbia river in the south to the Queen Charlotte islands in the north and extending 100 miles to sea. During this patrol no pilchards or encouraging signs of them were observed.

On August 24 and 26 one of the seaplanes operating for the department was utilized for a further search and succeeded in locating (on August 26) a number of schools of pilchards approximately thirty miles west-southwest of cape Flattery. As mentioned above, however, the distance was too great for profitable fishing operations.

It appears that during the period when pilchards usually are present off the west coast of Vancouver island the temperature of the water this season averaged ten degrees lower than normal. It has been suggested that the scarcity of the fish can be attributed partly to this condition and the unusual cold northeast winds.

#### FISH MEAL AND OIL

Notwithstanding the considerably improved demand for fish meal and oil, and the unusual efforts made to obtain reasonable supplies of the raw material, the total quantities processed were extremely disappointing. This was primarily due to the failure of the pilchard run. Only 1,108 tons of meal and 275,879 gallons of pilchard oil were obtained, as compared with 8,842 tons of meal and 1,315,864 gallons of oil in the preceding year.

The supplies of herring were more satisfactory, producing 4,078 tons of meal and 316,213 gallons of oil.

Whale products totalled 249 tons of bone and meal, 223 tons of fertilizer and 509,310 gallons of oil.

Other sources of reduction plant materials, including dogfish, salmon offal and halibut wastage, produced 1,596 tons of meal and 187,560 gallons of oil.

#### WHALING

As a result of an improved demand for meal and oil the one whaling company which has been actively interested in the hunting of whales since 1922,

but which, because of world market conditions, suspended whaling in 1931 and 1932, again operated in 1933. It obtained a total catch of 209 whales, 190 of which were of the valuable sperm variety.

#### FUR SEAL SKINS

It was expected that due to the poor demand and low price for fur seal skins the usual hunting by the Indians on the British Columbia coast during the year under review would not be intensive. As it turned out, the take of 1,984 was an increase of 237 over that of the preceding season.

It is interesting to note that no fur seal skins were passed through the Customs office at Prince Rupert for authentication during the year.

#### DESTRUCTION OF SEA LIONS

The sea lion hunting expedition this year arrived at the Virgin island on June 10, when the first landing was made. Between that date and June 23 hunting parties were successful in getting ashore at the Virgin and Pearl rocks no fewer than ten times, an unusually good showing in view of the weather conditions obtaining in that district which is exposed to the whole sweep of the Pacific. The C.G.S. *Givenchy* was again utilized for the hunting expedition and stood off from the rocks after sending parties ashore in the power boat and skiff.

At the Virgins 601 adults and 212 pups were accounted for and at the Pearls 109 adults and one pup, or a total of 923.

It is observed that no pups were seen on the Virgins during the last two huntings. It is possible that this may be the result of the parents having arrived earlier than usual on the hauling-out grounds and the pups having been sufficiently old to permit of their taking to the water before the arrival of the hunting expedition.

It is interesting to hear that the hunting party observed many fish bones on the southwest Virgin reef, which would apparently justify the conclusion that fish had been a portion, at least, of the diet of the sea lions although it has been understood that these mammals do not feed during breeding time.

#### PATROL SERVICE

In addition to the two steam vessels, the *Malaspina* and the *Givenchy* there were used in the protection of the fisheries 22 departmentally-owned and 68 chartered power boats, together with 5 rowboats.

The *Malaspina* logged during the year 25,028 miles and the *Givenchy* 18,003 miles.

A total of 255 hours 40 minutes were used in the flying patrol service. More flying time could have been consumed to advantage but this was not possible due to the necessity for curtailment of expenditures.

It is the writer's opinion that the patrol service during 1933 has been reduced to the lowest possible minimum consistent with reasonable protection for the immensely valuable fisheries resources. There is a limit beyond which reduction in patrol boats and personnel cannot go if the runs of fish are to receive reasonable protection. For the last two seasons it has been possible to make the necessary reductions and take care of conservation reasonably well but as the lack of boats, patrolmen and guardians becomes generally known the incentive to violate the regulations becomes greater and it is imperative that such protection be provided as will guard against any depletion of the supply of fish. A few dollars saved now may result in great loss to the public in the future.

## VIOLATIONS OF FISHERY REGULATIONS

The following statement shows the number of violations of the Fishery Regulations during the year, together with the amounts received in the way of fines and sales:—

—	District No. 1	District No. 2	District No. 3	Totals
Violations.....	43	54	63	160
Fines.....	425 00	1,320 00	727 50	2,472 50
Sales.....	45 45	271 96	241 56	558 97
Totals.....	470 45	1,591 96	969 06	3,031 47

It will be observed that there was a considerable increase in the number of violations in Districts Nos. 2 and 3. This undoubtedly was due to the more intensive seining operations as a result of a greater demand for the fall varieties of salmon.

## LICENCES

There were 49 salmon cannery licences issued, compared with 44 in the previous year; 238 salmon purse seine licences, compared with 157; and 6,113 salmon gill-net, compared with 5,359. (Cannery licences are issued by the province.)

The power boats used in salmon gill-net fishing in the northern areas have been increasing in numbers each year. In 1924 only 85 operated whereas in 1933 there were 2,287. The fishermen find power boats considerably more efficient and, certainly, the living accommodation is much more comfortable.

## SPORT FISHING

The year was again found to be quite a satisfactory one from a standpoint of abundance of sport fish for the many anglers whose number is increasing yearly.

With a view to increasing the supplies where required, and stocking barren lakes, there were 203 plantings of sport fish made during the year, totalling 5,960,578 eggs or fry, as follows:—

Species	Number of Plantings	Number of Eggs or Fry
Kamloops trout.....	99	3,626,837
Cutthroat trout.....	65	1,661,214
Brown Trout.....	7	176,589
Steelhead trout.....	12	171,398
Eastern brook trout.....	8	130,512
Rainbow trout.....	12	194,028
Totals.....	203	5,960 578

The number of plantings and the quantity shows some reduction compared with the preceding season but this was due chiefly to the disappointing collection of Kamloops trout eggs at Penask lake as a result of abnormally difficult freshet conditions.

Particularly good fishing was available for Kamloops trout at Paul, Pinantan and Fish lakes, in the vicinity of Kamloops. At these points the depart-



ment has been conducting fish cultural operations for some years and Paul lake, particularly, has been given close attention by officers of the Biological Board and a program of stocking has been worked out based on the food supply available to support a satisfactory fish population. The results during the past two years have been extremely encouraging and appear to justify the conclusion that by means of this system it is quite possible to maintain in all suitable lakes adequate supplies of sport fish of a size desired by the anglers.

As sport fishing becomes more intensive the necessity for intelligent study by properly qualified officers and the adoption of a comprehensive system of "farming" sport fish lakes becomes more and more apparent. Due largely to the encouragement given by the department, several anglers' associations have continued and enlarged their sport fish culture operations. Amongst those associations taking advantage of the facilities made available by the department are the following:—

Cranbrook District Rod and Gun Club at Cranbrook, where a hatchery has been maintained since 1923;

Kelowna Rod and Gun Club, Kelowna, where fish retaining ponds have been constructed and considerable success is being achieved;

Princeton Rod and Gun Club, Princeton, where one retaining pond has been constructed and operated;

Qualicum Fish and Game Association, Qualicum, whose members built one retaining pond, which was finally taken over by the Provincial Game Department and enlarged to a system of five ponds.

These anglers' associations have been very appreciative of the efforts made by the federal department to assist them in the way of donations of eggs and fry and the advice of the fish cultural officers and departmental engineers.

Sportsmen continue to obtain excellent catches of tyee and coho salmon by means of troll and fly at such points as Campbell river, Discovery passage, Comox harbour, Qualicum bay, Cowichan bay and Saanich inlet. The fly fishing for coho has been particularly attractive.

The writer had planned to continue the inspection of unorganized districts in the interior of the province during the year with a view to obtaining more information regarding the possibilities of the numerous lakes and streams but due to the difficult financial situation this work has been deferred.

#### FISH COOKERY LECTURES

In connection with the department's efforts to increase the consumption of fish in Canada, Mrs. Evelene Spencer spent from January 4 to March 26 in British Columbia conducting fish cooking demonstrations and lectures in Vancouver, Victoria, Prince Rupert and Kamloops. These meetings were well attended and with the assistance of the radio, which was placed at her disposal at no cost, Mrs. Spencer was enabled to reach a very large percentage of those with whom she wished to get in contact. The local industry was very much interested and gratified at this help from the department in assisting their marketing efforts.

#### ANNUAL MEETINGS OF FISHERIES OFFICERS AND FISHERIES COURSES

The annual meeting of fisheries supervisors and inspectors was again held at the Biological Station, Nanaimo, on February 24, when interesting discussion of matters affecting the administration and the industry generally took place.

It was found desirable to continue the course of instruction for fishery inspectors for an additional week at the Biological Station and the period from February 20 to March 1 was utilized for this purpose. The two inspectors who

had not had an opportunity to qualify as Grade 2 were given a short course at the station where they acquitted themselves creditably and as a result their classification was confirmed.

## STAFF

The number of individuals employed in the federal fisheries service in British Columbia during the year, at the peak, was reduced by 46 according to the following statement:—

Inspection and clerical staff.....	63
Guardians.....	32
Patrolmen and boat crews.....	198
Fish culture.....	136
Removal of obstructions.....	2
Total.....	<u>431</u>

Pursuant to Order in Council dated July 31, 1933, P.C. 1/1561, the following officers were retired on superannuation: George Franklin Found, Collector of Fish Revenue, Vancouver (15 years' service), and Horatio Shotton, Fishery Inspector Grade 1, Kamloops (21 years' service).

For the purpose of more efficient administration of the Fisheries service in British Columbia the following transfers of permanent officers were made during the year: Inspector G. E. Moore—From South Queen Charlottes district to Butedale district; Inspector D. S. Cameron—from Butedale district to Alert Bay district; Inspector H. F. Douglas—from Alert Bay district to Pender Harbour district; Inspector S. Boond—from Pender Harbour district to Quathiaski district; and Inspector A. F. Lloyd—from Quathiaski district to Cowichan district.

The re-arrangement left the South Queen Charlottes district vacant as far as a separate inspector is concerned and the whole of the Queen Charlottes district has again been included in the one area under the one inspector.

The transfers noted were made practically without cost as departmentally owned boats were utilized for this purpose.

(Reference to the work of the Engineering staff in British Columbia during the year is included in Appendix No. 4.)

## WHOLE PROVINCE—1925 to 1933

STATEMENT No. 1

Year	Num-ber of can-eries oper-ated	Number of salmon licences issued				Sockeye	Red Spring	Pink Spring	White Spring	Blue-backs	Steel-heads	Cohoos	Pinks	Chums	Totals
		G.N.	Troll	P.S.	D.S.	T.N.									
1925	65	4,225	1,821	329	37	19	39,142	4,419	29,938	10,675	1,996	188,505	445,400	607,904	1,720,622
1926	76	4,750	2,416	445	41	6	41,276	4,177	23,736	19,445	2,165	162,449	772,993	701,962	2,065,198
1927	76	5,637	3,093	555	46	7	34,029	8,819	16,129	20,820	1,746	161,148	247,617	562,109	1,360,449
1928	62	5,179	2,987	399	22	7	11,002	2,328	5,526	6,073	865	150,684	792,362	863,256	2,035,637
1929	63	5,609	2,630	371	24	7	8,295	3,156	7,926	22,246	672	174,198	477,969	424,982	1,400,750
1930	59	6,061	3,115	343	21	7	20,184	6,550	11,970	42,033	1,656	148,561	1,111,937	401,114	2,221,783
1931	35	4,893	3,115	228	21	7	17,526	4,727	4,894	25,296	1,326	76,879	206,995	55,997	685,104
1932	44	5,359	3,033	157	30	7	46,953	14,133	14,974	28,505	1,168	160,466	223,716	306,761	1,081,031
1933	49	6,113	2,880	238	31	8	12,464	1,849	5,953	21,763	1,459	137,289	532,558	293,630	1,265,072

NOTE.—Licences issued include transfers from one district to another, except in the case of purse seines after 1929.



STATEMENT No. 2

## PACK OF CANNED SALMON ON THE NAAS RIVER—1925 to 1933

Year	Number of canneries operated	Number of salmon licences issued				Sockeye	Red Spring	Pink Spring	White Spring	Blue-backs	Steel-heads	Cohoos	Pinks	Churns	Totals
		G.N.	Troll	P.S.	D.S.	T.N.									
*1925.....	3	210	.....	.....	.....	.....	5,441	387	538	.....	470	8,188	35,880	23,497	94,752
†1925.....	.....	.....	.....	.....	.....	.....	4,067	387	392	.....	457	7,736	34,530	22,504	89,008
*1926.....	4	316	.....	.....	.....	.....	4,616	751	597	.....	375	4,274	43,891	15,392	85,825
†1926.....	.....	.....	.....	.....	.....	.....	4,616	751	597	.....	375	4,274	50,815	15,392	92,749
*1927.....	4	302	.....	.....	.....	.....	3,221	511	213	.....	96	3,845	16,609	3,307	39,788
†1927.....	.....	.....	.....	.....	.....	.....	3,221	511	213	.....	96	3,845	16,609	3,307	39,788
*1928.....	3	263	.....	.....	.....	.....	1,471	68	615	.....	36	18,002	95,998	4,591	126,339
†1928.....	.....	.....	.....	.....	.....	.....	1,471	68	307	.....	36	10,734	83,183	3,538	104,877
*1929.....	3	240	.....	.....	.....	.....	16,347	256	96	.....	.....	1,195	10,507	1,261	29,669
†1929.....	.....	.....	.....	.....	.....	.....	16,077	256	96	.....	.....	1,145	10,342	1,212	29,185
*1930.....	3	282	.....	.....	.....	.....	26,500	283	176	.....	137	5,555	90,163	4,330	128,916
†1930.....	.....	.....	.....	.....	.....	.....	26,405	283	176	.....	84	961	79,976	3,853	113,460
*1931.....	1	235	.....	.....	.....	.....	16,929	323	106	.....	.....	8,943	5,178	660	33,149
†1931.....	.....	.....	.....	.....	.....	.....	9,146	323	106	.....	.....	3,443	3,575	392	14,995
*1932.....	3	278	.....	.....	.....	.....	15,138	264	468	.....	23	33,495	51,920	15,070	122,226
†1932.....	.....	.....	.....	.....	.....	.....	14,154	264	468	.....	10	7,955	44,629	14,515	85,671
*1933.....	3	297	.....	.....	.....	.....	10,173	.....	214	.....	114	19,016	57,406	2,778	90,942
†1933.....	.....	.....	.....	.....	.....	.....	885	227	184	.....	49	3,251	44,306	1,775	60,434

NOTE.—Licenses issued 1926-1931 include transfers from other districts.

\* Pack of fish caught at Naas River regardless where canned. † Pack at Naas River regardless where caught.

## PACK OF CANNED SALMON ON THE SKEENA RIVER—1925 TO 1933

STATEMENT No. 3

Year	Num-ber of can-neries oper-ated	Number of salmon licences issued				Sockeye	Red Spring	Pink Spring	White Spring	Blue-backs	Steel-heads	Cohoos	Pinks	Chums	Totals
		G.N.	Troll	P.S.	D.S.	T.N.									
†1925	13	1,067					17,811	1,657	2,457		700	38,029	127,226	10,687	276,352
†1925							19,185	1,657	2,603		713	39,168	130,083	74,308	348,866
†1926	15	1,129					17,896	966	1,750		764	30,153	170,586	46,382	350,804
†1926							17,896	966	1,750		764	30,209	210,064	63,527	407,533
†1927	13	1,195					13,595	3,567	1,609		646	25,209	38,903	9,656	177,173
†1927							14,856	3,567	1,609		580	25,623	38,761	18,659	187,639
†1928	11	1,208					4,121	988	397		231	18,751	191,812	11,792	262,616
†1928							5,043	988	354		241	30,194	209,579	17,751	298,709
†1929	11	1,143					3,795	441	383		13	37,138	94,846	3,625	217,955
†1929							3,795	441	383		13	37,456	95,305	4,835	220,242
†1930	11	1,202					6,589	1,047	322		60	24,191	214,266	3,327	380,754
†1930							6,674	1,047	324		58	29,203	275,642	5,057	450,377
†1931	8	1,076					7,040	2,284	534		768	20,146	41,264	3,893	183,865
†1931							7,040	2,284	534		768	10,737	44,807	3,610	162,809
†1932	10	1,119					16,378	9,419	2,472		404	48,312	58,261	38,549	233,711
†1932							14,268	9,419	2,472		365	20,549	32,519	28,756	160,972
†1933	10	1,218					2,626	444	227		267	39,806	95,783	15,714	185,463
†1933							6,805	444	828		201	21,366	79,932	10,970	148,239

† Pack of fish caught at Skeena River regardless where canned.

† Pack at Skeena River regardless where caught.

NOTE.—Licences issued include transfers from other districts.

PACK OF CANNED SALMON FROM FISH CAUGHT AT RIVERS INLET AND SMITHS INLET—1925 TO 1933

STATEMENT No. 4

Year	Num- ber of can- neries oper- ated	Number of salmon licences issued				Sockeye	Red Spring	Pink Spring	White Spring	Blue- backs	Steel- heads	Cohoos	Pinks	Chums	Totals
		G.N.	Troll	P.S.	D.S.	T.N.									
1925	11	1,127					344	311	116		10	4,887	7,675	11,501	226,030
1925							215	311	57			4,866	8,626	11,477	196,132
1926	12	1,483					535	249	160		27	10,348	8,493	14,490	124,341
1926							473	189	142		11	7,448	13,503	11,751	108,146
1927	13	1,842					463	530	321		19	5,475	1,383	5,027	114,271
1927							222	530	321		17	4,980	1,492	3,617	98,334
1928	11	1,541					458	443	157		13	9,761	3,130	9,200	116,523
1928							156	443	152		13	1,098	16,703	3,626	111,066
1929	13	1,577					546	215	127		47	8,270	3,112	6,536	98,401
1929							164	215	107		41	1,340	1,340	1,091	88,866
1930	12	1,833					614	383	229		182	6,760	17,476	18,372	194,414
1930							275	383	215		208	2,084	34,638	2,155	181,622
1931	5	1,433					218	61	183		69	5,536	2,296	544	101,779
1931							200	82	165		68	6,683	3,724	562	92,216
1932	10	1,754					86,110	236	145		56	11,871	4,305	5,516	108,644
1932							85,358	236	143		49	7,355	4,631	1,109	98,989
1933	11	1,962					119,548	108	243		153	9,678	11,658	8,932	150,326
1933							114,045	108	241		169	8,514	23,054	9,518	158,103

NOTE.—Figures shown in roman are packs from fish caught at Rivers Inlet or Smiths Inlet. Figures shown in italics 1925 to 1930, are actual packs irrespective of where fish taken and not including fish shipped out for canning in other districts.

NOTE.—Licences issued include transfers from other districts.



## PACK OF CANNED SALMON IN THE FRASER RIVER DISTRICT—1925 TO 1933

STATEMENT No. 5

Year	Num- ber of can- neries oper- ated	Number of salmon licences issued				Red Spring	Pink Spring	White Spring	Blue- backs	Steel- heads	Cohoos	Pinks	Chums	Totals
		G.N.	Troll	P.S.	D.S.	T.N.								
1925	10	969	50	.....	.....	.....	7,335	873	25,482	5,107	45	36,717	99,800	272,993
1926	10	1,063	59	.....	.....	.....	11,774	1,030	20,130	14,036	39	21,787	88,483	273,134
1927	10	1,249	111	.....	.....	.....	6,553	1,351	10,493	10,621	37	24,079	67,259	280,013
1928	8	1,303	109	.....	.....	.....	1,173	248	3,661	795	.....	27,061	193,106	255,455
1929	9	1,473	113	.....	.....	.....	2,984	912	5,977	11,960	53	40,540	144,208	425,131
1930	8	1,523	115	.....	.....	.....	8,300	3,066	9,761	27,857	22	25,535	68,946	282,137
1931	7	1,358	134	.....	.....	.....	5,970	1,185	3,187	14,697	4	13,468	21,534	115,681
1932	8	1,446	166	.....	.....	.....	19,994	3,622	11,020	16,558	23	28,685	45,100	218,362
1933	10	1,685	110	.....	.....	.....	5,701	426	4,554	13,299	.....	25,715	77,330	323,564

NOTE.—Licences issued include transfers from other districts.

## STATEMENT No. 6

## PACK OF CANNED SALMON OF PUGET SOUND, U.S.A., FROM 1925 TO 1933

Year	Number of canneries operated	Spring	Sockeye	Cohoe	Chum	Pink	Steel- head	Total
1925.....	23	28,268	106,064	171,587	41,635	555,848	141	903,543
1926.....	14	27,763	44,569	120,846	112,411	2,125	63	307,778
1927.....	21	43,443	96,343	133,528	37,414	585,506	216	896,450
1928.....	12	24,628	61,044	92,770	145,735	5,816	265	330,258
1929.....	21	32,600	111,855	101,363	150,867	727,748	280	1,124,715
1930.....	13	29,378	352,194	122,691	64,234	3,712	397	572,606
1931.....	18	28,066	83,728	76,025	55,189	705,580	293	948,881
1932.....	10	23,964	78,319	60,740	146,151	1,677	60	310,911
1933.....	19	20,869	125,738	44,568	37,039	543,340	222	771,776

## STATEMENT No. 7

## STATEMENT OF HALIBUT LANDINGS—BRITISH COLUMBIA—1913 TO 1933

	Cwt.		Cwt.
1913.....	223,465	1924.....	331,382
1914.....	214,444	1925.....	318,240
1915.....	194,896	1926.....	315,095
1916.....	123,062	1927.....	271,354
1917.....	113,529	1928.....	302,820
1918.....	186,229	1929.....	304,364
1919.....	210,777	1930.....	254,796
1920.....	238,770	1931.....	182,005
1921.....	325,868	1932.....	168,847
1922.....	293,184	1933.....	170,372
1923.....	334,667		

## STATEMENT No. 8

## STATEMENT OF DRY SALT HERRING PACKS, 1918-1933—BRITISH COLUMBIA

Year	District No. 1	District No. 2	District No. 3		Total
			East Coast	West Coast	
	cwt.	cwt.	cwt.	cwt.	cwt.
1918.....	20,000	.....	109,900	42,710	172,610
1919.....	4,000	.....	43,000	208,058	255,058
1920.....	807	1	176,640	334,720	512,168
1921.....	249	.....	231,240	248,482	479,971
1922.....	.....	.....	297,871	224,897	522,768
1923.....	.....	8,935	250,420	484,681	744,036
1924.....	.....	.....	305,266	548,277	853,543
1925.....	.....	4,120	591,162	487,892	1,083,174
1926.....	11,134	4,192	596,114	327,207	938,647
1927.....	24,380	7,600	542,385	473,825	1,048,190
1928.....	46,995	.....	748,032	277,161	1,072,188
1929.....	78,800	5,160	691,673	140,751	916,384
1930.....	19,114	.....	546,342	240,517	805,973
1931.....	.....	.....	668,506	119,721	788,227
1932.....	.....	.....	219,398	50,022	269,420
1933.....	.....	.....	448,944	64,080	513,024

## STATEMENT No. 9

## CANNED PILCHARD PACK—BRITISH COLUMBIA—1917 TO 1933

	Cases		Cases
1917.....	1,090	1926.....	26,731
1918.....	63,693	1927.....	58,501
1919.....	63,065	1928.....	65,097
1920.....	91,929	1929.....	98,821
1921.....	16,091	1930.....	55,166
1922.....	19,186	1931.....	17,336
1923.....	17,195	1932.....	4,622
1924.....	14,898	1933.....	2,946
1925.....	37,182		

## DEPARTMENT OF FISHERIES

## STATEMENT No. 10

## PRODUCTION FISH OIL AND MEAL—BRITISH COLUMBIA, 1920-1933

Year	From Pilchards		From Herring		From Whales			From Other Sources	
	Meal and fertilizer	Oil	Meal	Oil	Whale-bone and meal	Fertilizer	Oil	Meal and fertilizer	Oil
	tons	gals.	tons	gals.	tons	tons	gals.	tons	gals.
1920.....					503	1,035	604,070	466	55,669
1921.....								489	44,700
1922.....					326	230	283,314	911	75,461
1923.....					485	910	706,514	823	180,318
1924.....					292	926	645,657	1,709	241,376
1925.....	2,083	495,653			347	835	556,939	2,468	354,853
1926.....	8,481	1,898,721	310	13,700	340	666	468,206	1,752	217,150
1927.....	12,169	2,673,876	1,838	170,450	345	651	437,967	2,512	375,130
1928.....	14,500	3,995,806	831	68,411	376	754	571,914	3,658	411,207
1929.....	15,826	2,856,579	392	34,924	416	779	712,597	3,671	461,915
1930.....	13,934	3,204,058			273	581	525,533	2,420	182,636
1931.....	14,200	2,551,914	3,904	110,810				1,747	241,682
1932.....	8,842	1,315,864	6,195	156,173				413	45,517
1933.....	1,108	275,879	4,078	316,213	249	223	509,310	1,596	187,560

## STATEMENT No. 11

## WHALE CATCH LANDINGS, BRITISH COLUMBIA, 1922-1933

Species	1922	1923	1924	1925	1926	1927	1928	1929	1930	1933
Sperm.....	38	94	83	76	80	82	83	146	147	190
Sulphur.....	4	62	56	29	14	10	47	16	10	1
Fin.....	94	166	125	135	124	138	140	168	62	17
Hump.....	50	78	47	40	25	21	21	9	12	
Sei.....	1	53	100	68	25	7	13	67	89	1
Right.....			2		1					
Bottlenose.....		2	1	3			1	1		
Gray.....										
Totals.....	187	455	414	351	269	258	305	407	320	209

No whaling plants operated 1931 and 1932.

## STATEMENT No. 12

## STATEMENT OF FUR SEAL SKINS TAKEN AND LANDED, BRITISH COLUMBIA, 1912-1933

Year	District No. 1	District No. 2	District No. 3	Total
1912.....			205	205
1913.....			285	404
1914.....			95	352
1915.....			39	439
1916.....			21	159
1917.....			14	218
1918.....			78	88
1919.....			53	70
1920.....			502	1,058
1921.....			270	2,349
1922.....			291	930
1923.....			678	4,424
1924.....			370	2,232
1925.....			810	4,465
1926.....			655	2,824
1927.....			188	1,476
1928.....			465	2,090
1929.....			1,119	3,383
1930.....			195	2,297
1931.....			76	1,463
1932.....			88	1,787
1933.....			237	1,984



STATEMENT No. 13  
STATEMENT OF FISHERY LICENCES ISSUED—WHOLE PROVINCE—SEASON 1933-34

Variety	Issued				Transfers				Operating			
	White	Indian	Others	Jap. R.S.	Can- celled	Total	White	Indian	Jap. R.S.	Others	Indian	Total
Salmon trap-net.....	8	19	.....	.....	.....	8	.....	.....	.....	.....	19	8
Salmon drag-seine.....	12	74	.....	.....	.....	31	.....	.....	.....	.....	74	31
Salmon purse-seine.....	164	1,192	907	63	35	238	164	1,385	116	907	74	238
Salmon gill-net.....	2,878	1,192	154	7	16	5,075	3,670	1,385	116	907	1,385	6,113
Salmon trolling.....	2,107	531	622	.....	12	2,815	2,172	531	7	154	531	2,880
Asst. salmon gill-net.....	212	371	622	.....	12	1,217	212	371	.....	622	371	1,217
Capt. salmon seine.....	47	68	.....	.....	.....	115	47	68	.....	.....	68	115
Asst. salmon seine.....	761	689	.....	.....	16	1,466	761	689	.....	.....	689	1,466
Abalone.....	1	1	.....	2	.....	4	1	1	2	.....	1	4
Cod.....	172	13	145	5	18	353	172	13	5	145	13	353
Crab.....	88	14	1	1	.....	104	88	14	1	1	14	104
Grayfish.....	9	.....	64	1	.....	74	9	.....	.....	64	74	74
Smelt.....	30	1	15	2	.....	49	30	1	.....	15	1	49
Small inshore dragger.....	18	.....	9	.....	1	28	18	.....	.....	9	.....	28
Miscellaneous fishery.....	54	9	27	4	2	96	54	9	.....	27	9	96
Herring pound.....	10	.....	.....	.....	.....	10	10	.....	.....	.....	.....	10
Herring purse-seine.....	34	1	2	.....	.....	37	34	1	.....	2	1	37
Herring gill-net.....	15	.....	4	.....	.....	19	15	.....	.....	4	.....	19
Capt. herring seine.....	14	2	4	.....	1	20	14	2	.....	4	2	20
Asst. herring seine.....	222	61	156	.....	.....	439	222	61	.....	156	61	439
Pitchard purse-seine.....	28	.....	.....	.....	.....	28	28	.....	.....	.....	.....	28
Capt. pitchard seine.....	23	2	.....	.....	.....	25	23	2	.....	.....	2	25
Asst. pitchard seine.....	165	12	.....	.....	.....	177	165	12	.....	.....	12	177
Capt. halibut boat for bat.....	4	.....	.....	.....	.....	4	4	.....	.....	.....	.....	4
Totals.....	7,076	3,060	2,110	85	102	12,433	7,933	3,253	138	2,110	3,253	13,536

Indian permits, 1934. Angling permits, 1036 (5 cancelled).

LICENCES ISSUED BY PROVINCIAL GOVERNMENT FISHERIES DEPARTMENT

Salmon canneries.....	49	Salmon dry saltery.....	13
Pitchard canneries.....	2	Herring dry saltery.....	8
Miscellaneous canneries.....	8	Pitchard reduction.....	5
Tiered salmon plants.....	4	Whale reduction.....	1

## DEPARTMENT OF FISHERIES

## STATEMENT No. 14

## STATEMENT OF SALMON LICENCES ISSUED—BRITISH COLUMBIA, 1919-1933

Kind of Licence	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933
<i>District No. 1—</i>															
Salmon cannery...	14	11	13	10	11	9	10	10	10	10	9	11	7	8	10
Salmon gill-net....	1,337	1,288	1,437	1,296	964	969	969	1,063	1,249	1,303	1,473	1,523	1,358	1,446	1,685
<i>District No. 2—</i>															
Salmon cannery...	45	41	32	41	37	38	41	50	48	47	45	26	21	28	29
Salmon purse-seine	35	79	13	73	126	107	137	193	244	158	153	152	71	53	55
Salmon drag-seine	81	38	30	30	20	19	15	14	16	9	9	9	9	9	11
Salmon gill-net:—															
Lowie Inlet.....	300	342	338	304	244	210	210	316	302	263	246	282	235	278	297
Naas River.....	1,153	1,153	1,109	1,091	900	941	1,068	1,129	1,198	1,208	1,143	1,202	1,076	1,119	1,218
Skeena River.....		871	1,000	1,012	987	770	891	1,115	1,273	1,117	1,149	1,449	1,144	1,461	1,603
Rivers Inlet.....	916	1,373	215	179	197	193	236	368	570	424	428	384	289	293	359
Smiths Inlet.....		193	241	165	134	146	139	192	195	173	236	359	240	238	228
Bella Coola.....				120	122	96	137	100	104	80	194				
Kimsquit.....	421	61	5		63	32	60	37	108	58	56	71	51	55	43
Butedale.....		136	138	136	215	87	109	139	180	77	116	142	108	100	107
Namu.....															
Queen Charlotte Islands.....		14	1	4	1	1	17	27	42	22	3	6	5	4	2
Total, District No. 2.....	2,490	2,943	3,047	3,011	2,863	2,476	2,867	3,423	3,972	3,422	3,571	3,895	3,148	3,577	3,916
<i>District No. 3—</i>															
Salmon cannery...	23	13	11	14	13	15	16	19	18	19	17	17	7	8	10
Salmon purse-seine	103	76	46	74	97	135	192	252	308	239	218	191	157	104	183
Salmon drag-seine	23	7	5	10	11	13	22	27	30	13	13	12	12	21	20
Salmon gill-net....	771	530	293	176	142	251	390	364	422	454	565	643	387	336	512
<i>Whole Province—</i>															
Salmon cannery...	82	65	56	65	61	62	67	79	76	76	71	84	35	44	49
Salmon purse-seine	138	155	59	147	223	242	329	445	552	397	371	243	228	157	236
Salmon drag-seine	104	45	35	40	31	32	37	41	46	22	22	21	21	36	31
Salmon gill-net....	4,598	4,761	4,777	4,483	3,969	3,696	4,226	4,850	5,643	5,179	5,609	6,061	4,893	5,359	6,113

NOTE.—During the season 1928 F. Miller's cannery at Vancouver, the Cassiar Cannery on the Skeena and the Massett Cannery, Massett Inlet, operated without licences, and are not included in the number of cannery licences shown above.

## STATEMENT No. 15

## STATEMENT OF POWER BOATS OPERATED IN DISTRICT No. 2, BRITISH COLUMBIA, IN CONNECTION WITH SALMON GILLNET OPERATIONS

	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933
Naas river.....	3	9	35	21	37	34	119	142	179	223
Skeena river.....	18	64	133	162	216	263	472	603	660	668
Bella Coola and Kimsquit.....	1	12	49	47	90	70	124	94	89	101
Central area.....		8	28	87	103	73		68	111	165
Rivers inlet.....	54	110	254	248	479	435	712	682	776	901
Smiths inlet.....	9	39	131	110	204	135	231	176	175	219
Queen Charlotte Islands.....					10					
	85	242	630	675	1,049	1,010	1,658	1,765	1,990	2,287

## STATEMENT No. 16

## PACK OF SOCKEYE SALMON FROM RUNS TO FRASER RIVER, 1925-1933

Year	Fraser river canneries	Canadian traps in Juan de Fuca Straits	Puget Sound (U.S.A.) canneries	Total
1925.....	31,523	3,862	106,064	141,449
1926.....	83,589	2,091	44,569	130,249
1927.....	57,085	4,337	96,343	157,765
1928.....	26,530	2,769	61,044	90,343
1929.....	60,407	3,480	111,856	175,743
1930.....	93,416*	5,334	352,194	450,944
1931.....	38,507*	2,440	83,728	124,675
1932.....	61,769*	4,000	78,319	144,088
1933.....	43,745*	8,721	125,738	178,204

\* Does not include Sockeye canned on Fraser and caught in other districts.

NOTE.—A statement showing the yearly figures from 1876 to 1930 will be found in the departmental report for 1930-31.

## STATEMENT No. 17

## AIR PATROL SERVICE, 1933

Base	Hours	Minutes
Alert Bay.....	19	30
Nanaimo.....	101	25
Swanson Bay.....	139	30
Total for Season.....	260	25

## SUMMARY

Year	Hours	Minutes
1927.....	92	02
1928.....	261	30
1929.....	408	08
1930.....	443	40
1931.....	319	25
1932.....	275	25
1933.....	255	40

## STATEMENT No. 18

STATEMENT OF NUMBERS OF DIFFERENT SPECIES OF SALMON AND METHOD OF CAPTURE REPORTED BY OPERATORS OF SALMON PURSE-SEINES, DRAG-SEINES, AND TRAP-NETS, AND BY SALMON CANNING, CURING AND COLD STORAGE ESTABLISHMENTS, OF GILL-NET AND TROLL CAUGHT FISH, BRITISH COLUMBIA, 1933

—	Sockeye	Springs	Blue-backs	Steel-heads	Cohoës	Pinks	Chums	Totals
Gill-net.....	3, 176, 074	274, 059	7, 480	70, 378	787, 656	3, 720, 241	575, 283	8, 611, 171
Purse-seines.....	208, 378	18, 728	14, 132	1, 674	242, 969	4, 994, 788	2, 503, 053	7, 983, 722
Drag-seines.....	55, 619	198	.....	7	18, 211	104, 053	5, 876	183, 964
Troll.....	241	135, 786	371, 448	671	475, 852	171, 409	32, 672	1, 188, 079
Trap-nets.....	121, 458	19, 447	175	1, 317	50, 480	377, 828	2, 901	573, 606
Totals.....	3, 561, 770	448, 218	393, 235	74, 047	1, 575, 168	9, 368, 319	3, 119, 785	18, 540, 542

## REPORT ON SPAWNING GROUNDS, 1933

*North Queen Charlotte Islands*

Sockeye salmon run to this area only in small quantities. The streams frequented are the Yakoun and Awun rivers and one or two other minor streams. The size of the runs is not a material factor in the salmon pack. An average return was observed in the streams this year. These remarks apply very largely to the springs and cohoës. Although much of the trolling in the north is carried on along the north coast of the Queen Charlotte group, these salmon apparently are heading for spawning grounds on the mainland.

The pink run in the North Queen Charlottes is heavy in the even-numbered years and during the odd-numbered, including this year, the quantities of this variety are negligible. The conditions found this season were average.

There are several fair chum streams and the run this season has been normal.



*South Queen Charlotte Islands*

The coho run to this area is not a large factor in the fishing operations. This season was an "off" one for pink salmon although some were found in Copper river, Tl-ell river and Riley creek.

The precautions taken during recent seasons for the protection of the chum run have obtained excellent results and the quantity of these fish found on the spawning grounds was very satisfactory.

*Naas River Area*

The same officer who has made the inspection of the Meziaden area during recent years was again employed this year and reports that the run of sockeye to that district was found to be not particularly satisfactory; this has reference to both the early and late runs. The quantity of spawning fish observed, however, was estimated as greater than in 1927, about fifty per cent better than in 1928 but from forty to fifty per cent less than in 1929.

It should be mentioned again that an inspection covering a period of a few days is not all that could be desired when it is remembered that the sockeye run continues for several weeks. It is impossible to provide a really adequate inspection of such isolated areas, unless, at very considerable expense, officers are maintained at these points during the whole period of the run.

The inspection of the lower portion of the watershed would seem to show that a satisfactory proportion of the run had passed through the commercial fishing areas. This is evidenced by the good catches made by the Indians farther up the river for their own food purposes.

The upper reaches of the Naas are very difficult of access but it was possible to obtain a fair estimate of the quantities of spawning fish and indications would appear to point to a normal supply of sockeye.

Supplies of springs and cohoes were reported as being greater than found during any previous inspection.

Pink salmon were found in satisfactory numbers on the spawning grounds and the conditions regarding chums were found to be normal although it was early in the season for this variety. The Naas is not a heavy producer of chums.

*Skeena River Area*

It was not expected that there would be any large quantity of spawning sockeye found in this area, due to the light seedings of the previous cycle years, and the inspection confirmed these expectations.

At Babine lake the principal spawning beds are 15-Mile creek, Fulton river, Morris river and lake, and the Babine river.

At 15-Mile creek the first run was over two weeks late compared to 1929 and was estimated to be fairly satisfactory, although smaller than that of the year above mentioned. The second run arrived in the second week of September and is reported as a heavy one. The seeding of this creek evidently is entirely satisfactory.

At Fulton river the run was reported as being surprisingly good. This is confirmed by the Indians, who obtained a portion of their winter food supply at this point. The inspecting officer feels that the number found was considerably less than in 1929, although heavier than any season since that year.

At Morrison creek, where the hatchery is situated, the run was the best in the last three seasons but not as good as that of the brood year 1929. Whilst it is a fact that the hatchery did not obtain a sufficient quantity of eggs to fill the establishment to capacity, this cannot be taken as evidence of an unsatisfactory run as the lower fence was not closed until a portion of the run had passed through.

The lower portion of the Babine river itself is reported to have received a heavy run of sockeye, whilst few sockeye were found in the rest of the river. The inspecting officer is rather of the opinion that it is the five-year fish which are usually the most plentiful in this portion and he points out that there was a small run four years ago but a heavy run of large fish in 1928. A good run of five-year fish is expected next season.

A plentiful supply of spring salmon was found in the area and good supplies of pinks and cohoes as well.

In the Kispiox and Kitwonga areas small quantities of sockeye were observed. This also applies to the Slangese river. In the Morice river and lake area the supply of sockeye seems to have been fair, but it is very difficult to make a thorough inspection of this area. An attempt has been made by means of seaplane and by pack horse but the officers are of the opinion that the only adequate method is by means of a boat with an outboard engine of sufficient power to contend with the swift water.

The supply of springs found was very satisfactory and this was true also in the case of the cohoes.

The sockeye run to Williams lake, in the Lakelse area, is reported by the superintendent of the hatchery as being a good one, exceeding that of the brood year of 1929. It is pointed out, however, that most of these sockeye are taken for hatchery purposes. This is the main sockeye spawning ground in the area.

In the case of Schullbuckhund creek the conditions were quite the reverse and the showing found this season was poor compared with that of 1929. No doubt this condition was due largely to the damage done to the spawning grounds in 1929 by the severe freshets.

The supply of pinks may be considered as fair but the cohoes, on the other hand, appeared in large quantities and were reported by the superintendent as being in greater numbers than he has observed.

The supply of spawning sockeye in the Ochstal river watershed was light and could hardly be considered as satisfactory, but there were good supplies of springs, chums, cohoes and pinks.

Considering the Skeena watershed as a whole, the return of sockeye salmon appears to have been much better than might have been expected when one considers the small commercial catch.

#### *Lowe Inlet Area*

The sockeye supply showed an increase over the cycle year, generally speaking, but there were several streams where there is necessity for further conservation measures. The proper action will be taken with a view to providing for a larger escapement.

The coho supply was very satisfactory in practically all streams. This remark applies also to the pinks and the inspecting officer suggests that the conditions found would indicate a gradual building up of the "off" year run. In the case of the chums, the supplies were rather light although it is considered that the spawning beds will be fairly well seeded.

#### *Butedale Area*

Sockeye appeared in sufficient numbers to seed the spawning grounds fairly well.

The escapement of cohoes was quite satisfactory. At Indian river, particularly, there was a very heavy seeding.

The pink run was fourteen days later than usual and the quantities observed on the spawning grounds were larger than the commercial catches would indicate. The seeding was quite satisfactory.

At Mussell, Kynoch and Green inlets the streams were better seeded than other parts of the area and, on the whole, the chum seeding can be considered as only fair.



*Bella Bella Area*

There was a good average supply of sockeye found on the spawning beds. It was necessary to increase the closed time in the northern part of the area but the additional two weeks added appears to have given the desired results.

Cohoos, while showing well in some rivers, did not appear, generally speaking, in particularly satisfactory quantities.

The pink supply was not more than fair even though it was an "off" year for this variety. The same remark applies to chums.

*Bella Coola-Kimsquit Area*

The principal spawning areas in these two districts are the Bella Coola or Atnarko river (at the head of Burke channel) and the Kimsquit river (at the head of the channel of that name). In the Bella Coola river it was found that while the supply of spawning sockeye was reasonably good, and estimated to be sufficient to provide a good return, it was not quite equal to the run of 1929. The commercial catch in this area was unusually good. It is worthy of note that the run of sockeye arrived on the spawning grounds two weeks earlier than usual.

Notwithstanding the fact that springs have not been fished to any extent in this area, the supplies on the spawning grounds do not appear to increase. No doubt the trolling operations at distant points have their effect on the run to Bella Coola as well as to other districts.

Cohoos were fewer in number than usual. The run of pinks, however, is stated by the inspecting officer to have been a very heavy one, all gravel bars being crowded with spawning salmon of this variety. The situation with regard to chums was quite satisfactory.

The sockeye return to the spawning grounds in the Kimsquit river was the best observed in several seasons, noticeably larger than the quantities appearing in the brood year of 1929.

The coho supplies observed were not satisfactory but, of course, in the case of this stream, as in most others frequented by cohoes, the run continues well into the winter months. The supply of chums was quite satisfactory. The pink run this season was smaller than usual but the Kimsquit is not a good pink stream.

The streams along the shores of Burke and Dean channels other than the ones referred to above are frequented by the fall varieties of salmon and appeared to be doing rather better than holding their own. In recent years extra precautions have been taken with a view to building up the runs here and these efforts apparently are proving successful.

Although heavy rainfalls occurred during the spawning time there was no evidence of damage to the spawning grounds at the time of inspection. The inspection was carried out by means of a seaplane. In this way the trip was made in two days, with the use of two hours' flying time; otherwise a difficult trip of from twelve to sixteen days would have been necessary.

*Rivers Inlet Area*

Two trips of inspection were made in this area; the first covering the period from the 9th to 12th of September, for the purpose of observing the results of the early runs of sockeye to the upper reaches, and the second from October 14 to 22.

The early run of sockeye to the Wak-Wash river was found to be exceptionally heavy. This river is frequented by what spring salmon enter Owekano lake. The quantity found was not as large as usual. The Cheo river contained a reasonably heavy supply of sockeye salmon and the supply found in Indian



river was even greater. The inspecting officer observes after his two inspections of these streams that it must be concluded there was a remarkable escapement of sockeye this season in these streams.

At Genesi river the escapement was found to be a normal one.

At Shumahalt river a fair supply of sockeye was observed. In Markwell river no sockeye were observed but this is not unusual as the stream is extremely muddy and in the past, so far as is known, has not been a material factor in the production of sockeye salmon.

Nookins river was found to contain a satisfactory supply of spawning sockeye, and the same is true of Askum river.

Quap river contained quite a satisfactory supply of sockeye and the conditions at Dallec river were normal.

It is gratifying to find the spawning grounds in this area so well seeded, particularly in view of the excellent commercial catch.

#### *Smiths Inlet Area*

Two trips of inspection were also made in this area, the first one by plane on the 17th of September. There are only two sockeye streams of any account, viz., the Geluck and Delebah. These were found on both inspections to be splendidly supplied with sockeye, which promises well for the cycle year.

At Nekite river, at the head of Smiths inlet, the run of pinks appears to be increasing although the supplies of cohoes and chums were rather light.

In Takoosh river the fishing area was closed this year in order to restore the run of the unusually good variety of chums. It is intended to keep the area closed for four years. The supplies on the spawning grounds this season were found not to be satisfactory.

#### *Alert Bay Area*

The important sockeye streams in this area are the Nimpkish river and the stream entering at the head of Glendale cove.

Due primarily to high water conditions, a very satisfactory proportion of the run escaped to the spawning grounds of the Nimpkish system and the seeding at Glendale cove and the points of lesser importance, such as McKenzie sound, Thomson sound and Port Neville, was quite good.

The early runs of the creek variety at Hardy bay and the Shushartie and Nahwitti rivers were not fished and all passed safely to the spawning grounds.

The escapement of springs in Knight and Kingcome inlets and along the mainland shore generally was found to be good, due partly, no doubt, to the fact that the toll taken by the fishermen was very light. The escapement to the Nimpkish system was also quite satisfactory.

It is in the even-numbered years that the pink run to the Alert Bay area in larger quantities but this year the supply was better than in the brood year of 1931.

A good escapement of both cohoes and chums was observed.

#### *Quathiaski Area*

A satisfactory supply of spawning sockeye reached the beds in Phillips arm, which is the most important district for this variety. At Hayden bay conditions were not quite so satisfactory but arrangements are being made to give this run further protection.

A large escapement of springs was observed on the spawning grounds. The run to Campbell river was somewhat better than last season and a large percentage of the run escaped to the spawning areas.

The pink run was quite as good as that of the brood year and the seeding of chums and cohoes was entirely satisfactory.

*Pender Harbour Area*

Sockeye run only to the Saginaw system. A heavy escapement was found this year on the spawning grounds.

The pink supply at Jervis inlet is being maintained. Apparently in this area the years are fairly even and the spawning has been quite adequate. At Toba inlet and in other parts of the district pinks were found in greater quantities than in the cycle year.

The coho seeding was quite satisfactory, in comparison with that of the brood year, but the quantity of chums found was rather light.

*Comox Area*

An unusually large supply of springs was reported on the spawning grounds of the Puntledge river. The pink supply exceeded that of the brood year of 1931 although it was the "off" year for the district. The Tsoleum river was particularly well seeded.

Coho were found in very considerable quantities and the run was entirely satisfactory. In the case of the chums, a large supply was observed on the spawning areas of the Puntledge river and in several of the smaller streams which flow into Bayne sound. The other streams, however, were not so well seeded.

*Nanaimo Area*

Coho salmon were found in unusually large quantities on the spawning grounds in the Nanoose bay portion of the area and a good average supply in the Nanimo river. The chum run in the Nanoose area was an improvement over the brood year but it was somewhat less in Nanaimo river.

*Ladysmith Area*

Coho were found to be in quite satisfactory quantities in the Ladysmith area and the pink supply was equal to that of the brood year.

In the Chemainus river the chum run was not up to expectations but equal to that of 1929. In the smaller streams, however, conditions were found to be more satisfactory.

*Cowichan Area*

The spring supply is considered a fair average one. In the case of the cohoes, the run is reported as the best for many years.

The chum supply was quite satisfactory. It is rarely fished except by the Indians for food purposes.

It is interesting to note that in the Cowichan and Koksilah rivers, two of the most important sport fishing streams on the island, the run of steelhead was one of the best observed in recent years.

*Victoria Area*

The coho supply found was quite a satisfactory one but the chum run can be considered as only fair. These runs are fished very little.

*Alberni Area*

The sockeye streams of this area are the Somass river, Anderson river and the Hobarton river, in Nitinat lake. The inspecting officer refers to the spawning conditions found in the Somass river as the very best. In the Anderson river, however, conditions were quite different and a very poor supply arrived on the spawning grounds. Arrangements are being made to provide for a larger percentage of escapement in future years. At the Hobarton river the escapement

was found to be quite satisfactory. The inspecting officer remarks in this case that the size of the individual fish comprising the run to Hobarton river appears to be increasing very materially.

The supply of springs found in the Somass, Anderson, Nahmint and Nitinat areas was found to be very good and that to the Serita and Toquart areas, while not so good, was quite satisfactory.

Coho arrived in all the streams entering Alberni canal in large quantities and in the opinion of the reporting officer the supply of that variety in the district is showing a large increase.

Spawning conditions in the case of chums were found to be good. There was not much fishing equipment operated and consequently a larger percentage of the run escaped.

#### *Clayoquot Area*

The sockeye spawning in the Kennedy lake section, which is the most important area, was not as satisfactory as could be desired, although a fairly good run ascended the Medgin river.

The peculiar conditions obtaining at the mouth of Kennedy river made it very difficult to permit any commercial fishing at all and be sure of a reasonable quantity for the spawning grounds. The supply of sockeye will, of course, be of no use to anyone unless permission is given to fish them commercially to some extent. Notwithstanding strenuous opposition, unusual precautions have been taken in recent years to be sure of a proper escapement but even with these precautions there are times when, owing to the difficulty of knowing the movements of the fish, a larger percentage than desirable is captured.

The quantities of springs and cohoes found were larger than usual and very satisfactory. This was so in the case of chums also, although the run was somewhat lighter than in the brood year. The spawning grounds were well seeded.

#### *Nootka Area*

Sockeye salmon did not arrive in important quantities in this district although there is usually a fair run of the creek variety to the Gold river.

The coho supply, which is never large in this district, compared favourably with other years.

The chum supply was somewhat disappointing, although unusual closures were arranged in order to provide a larger percentage of escapement.

#### *Kyuquot Area*

The usual small run of creek sockeye was observed, but in this area the sockeye variety is not an important factor.

Springs and cohoes were found in quite satisfactory quantities on the spawning areas.

In the case of the chums, the situation was not so satisfactory, the inspecting officer reporting the smallest run since 1925.

#### *Quatsino Area*

The sockeye running to this area are of the creek variety and not an important factor in the commercial fishing. The spawning conditions were found to be quite adequate.

The run of springs was only fair and appears to have been not as satisfactory as in the two preceding seasons, although the water conditions made observation difficult.

The coho supplies were found to be good and the supply of chums equalled that of four years ago.



*Fraser River Watershed*

Nineteen thirty-three was the cycle year of the previous big sockeye run, and whilst there was no particular reason to expect a large return, due to the conditions obtaining following the catastrophe of 1913, yet a good run would not have been surprising. Actually, conditions found were very much as might have been expected.

The usual large quantity of pinks arrived in this, the cycle year of the big run of this variety. The usual spawning grounds were satisfactorily seeded.

The supply of springs on the spawning grounds was not as satisfactory as could be desired, though far from being a failure.

The seeding of cohoes and chums was found to be fairly average.

Unusually heavy rainfalls and mild weather during the fall months caused flood conditions in many streams, particularly near the coast; the run-off was approximately 50 per cent greater than normal.

The situation in more detail is as follows: Prince George District. As a result of the unusually satisfactory escapement to the spawning areas in this system in 1929, it was hoped that a much larger return would have been observed in 1933. The reports, however, have not been encouraging. It is a fact that in the upper reaches of the Stuart, Trembleur and Takla lakes fair quantities of sockeye were observed, but in the lower reaches of Stuart lake system the spawning was disappointing.

The sockeye this year were apparently quite late in arriving, the first being observed on August 9 and the second run appearing on September 9. The former were in very poor condition but the latter were quite the contrary.

The Indians in the Fort St. James district obtained approximately 1,000 sockeye.

In the Francois-Fraser lake area there was quite an appreciable increase over the brood year of 1929; in fact, the run is reported as the largest in many years. Good supplies of sockeye were seen in Ormond creek and Stellako river in the Fraser lake area, a 100 per cent increase over 1929. This year, for the first time in many years, sockeye were reported from the Burns lake watershed in such streams as the Endaka river, Shovel creek, Poison creek and Tchisinkut creek.

Quesnel District. The reports from this area show the return of sockeye above the average and the inspecting officer suggests that it has been the best run in eight years. It must be remembered, however, that the number of spawning sockeye returning to the Bowron system has been very small in recent seasons and this year's report cannot be taken as evidence of any large quantity.

In the Quesnel lake system there was a small run of sockeye observed commencing on August 22, but this return cannot be considered as encouraging.

Chilco Lake System. It will be remembered that in the brood year of 1929 the inspecting officer reported having seen approximately 70,000 spawning sockeye. This year the same officer reports at least 100,000 sockeye as having reached the spawning grounds in good condition. He states that it is the largest quantity he has observed in his ten years' experience in the district and from information received he is of the opinion that it is the best in the last twenty years.

Shuswap Lake System. At Little river and Adams river there was observed an increase in the number of spawning sockeye compared with the brood year but the return was not as large as expected. A few were also observed in Scotch creek.

Hope Area. A few sockeye were noticed in the creek at the head of Kawkawa lake and a few in the Nahatlatch river, as well as some of the smaller streams between Hope and Lytton. The numbers compared favourably with those observed in 1929.

The conditions at Hells Gate canyon were normal and the salmon, although delayed at times for short periods, were able to pass this point safely.

Harrison Lake-Birkenhead System. There was no increase in the number of sockeye on the spawning grounds in the Harrison district as compared with the year 1929.

Springs and chums were not as numerous as could be desired. Although the supply of pinks was not heavy, yet it was reasonably satisfactory.

In the Birkenhead system the supply of fish on the spawning grounds was quite disappointing. The hatchery obtained a collection of only 10,674,000 sockeye eggs.

In this connection it is felt that the Indians are taking far too great a toll from the run passing up the system from the Fraser river and steps are being taken to reduce this quantity very materially in future seasons.

Cultus Lake Area. At Cultus lake it is not expected that the number of returning sockeye will exceed 3,500 spawners.

There was also a run of sockeye to Chilliwack lake but it was no greater than average. The supplies of springs, chums and pinks were satisfactory.

Pitt Lake Area. At Pitt lake high water conditions were experienced which interfered with observations. The collection at the hatchery was only 2,285,900 sockeye eggs, but as a result of the washing out of the fences a portion of the run passed to the spawning grounds and deposited their eggs under natural conditions. The two high water periods occurred just when the greatest number of fish were below the fences.

Squamish Area. The supply of springs compared favourably with those of recent years. Pinks, although probably not quite as numerous as in 1931, appeared in satisfactory quantities. These remarks also apply to the chums and cohoes.

## APPENDIX No. II

### SUMMARY REPORT OF THE WORK OF THE BIOLOGICAL BOARD OF CANADA FOR 1933

BY THE CHAIRMAN, PROF. J. PLAYFAIR McMURRICH

The Biological Board of Canada, operating under the Minister of Fisheries, was established by Act of Parliament in 1912 and is supported by an annual grant from Parliament. Its membership includes representatives of the Department of Fisheries, of the fishing industry and of a number of Canadian universities. During the year the membership has been as follows:—

Prof. J. Playfair McMurrich, University of Toronto, Chairman.

J. J. Cowie, Department of Fisheries, Secretary and Treasurer.

E. W. Gilbert, Department of Fisheries, Assistant Treasurer.

Prof. R. J. Bean, Dalhousie University.

Pro. A. T. Cameron, University of Manitoba.

Prof. A. F. Chaisson, St. Francis Xavier University.

Prof. Philip Cox, University of New Brunswick.

John Dybhavn, Prince Rupert, British Columbia.

Prof. A. H. Hutchinson, University of British Columbia.

Prof. W. T. MacClement, Queen's University.

Prof. Marie-Victorin, University of Montreal.

Prof. H. G. Perry, Acadia University.

Prof. E. E. Prince, Department of Fisheries.

J. A. Rodd, Department of Fisheries.

Prof. W. P. Thompson, University of Saskatchewan.

Prof. A. Vachon, Laval University.

Doctor R. C. Wallace, University of Alberta.

A. H. Whitman, Halifax, Nova Scotia.

Prof. A. Willey, McGill University.

During the year two changes took place in the personnel of the board. Dr. Willey having retired from active service, McGill University recommended the appointment of Prof. D. L. Thomson as his successor; similarly, the retirement of Mr. E. W. Gilbert led to the appointment of Mr. F. O. Weeks as Assistant Treasurer.

As in past years the board has maintained four stations for the investigation of fishery problems, these being situated at St. Andrews, New Brunswick, Halifax, Nova Scotia, Nanaimo, British Columbia, and Prince Rupert, British Columbia. In addition, two substations have been carried on for the investigation of special problems connected with the fisheries, one at Ellerslie, Prince Edward Island, for the investigation of the oyster problem, and the other at Cultus lake, British Columbia, where the natural history of the Pacific salmon is being intensively studied. Each station has a director and a staff, selected with a view to the character of the problems that are to be studied. The members of the board give their services gratuitously.

For reasons of economy the full board meets only once a year. In the interval the business of the board is conducted by an Executive Committee, appointed at the annual meeting, and in addition there are Atlantic and Pacific Sub-Executive Committees, which report to the Central Executive the needs and problems of their respective territories.

Great reduction in the annual grant to the board necessarily resulted in curtailment of the work at the various stations; nevertheless the year's work,



under the circumstances, must be regarded as satisfactory. Its results are set forth in the reports of the directors of the stations and members of their staffs published in the board's annual report and only some of the more important investigations may be briefly referred to here.

The runs of herring in the Passamaquoddy area were studied in their connections with the oceanographic and meteorological conditions prevailing, and much interesting information was obtained. The distribution and migration of cod in the Halifax area received attention, a problem of much interest on account of the well-marked stratification of the waters of the area. Studies of the natural history of the Atlantic salmon were also continued and an interesting result was obtained from an experiment begun in the previous year. In 1932, eggs from Restigouche salmon were planted in a stream to which there had been no salmon run for at least fifty years; the fry flourished and became parr in the succeeding year and in the autumn of that year there was a run to the stream of adult salmon. Progress was made in the study of the oyster in Richmond bay, it being found that the method of rearing spat on cultch suspended in baskets above the bottom of the water was very successful, protecting the spat from silt and from the depredations of starfish. Mention may also be made of the determination of the amount of gastric juice secreted as the result of partaking of various fish foods, a study important from the viewpoint of dietetics.

The smoking of fish by conditioned air has received continued attention with a view to reduction in the cost of the apparatus and to the prevention of "banding." In both particulars success has followed. The problem of devising at a moderate cost a system of cold storage for bait has also engaged attention, and improvements in the methods of canning tuna and mackerel and numerous analyses and determinations of the nutritive values of fish meal have been made.

The study of the Pacific salmon has been vigorously continued; for a summary of the results reference may be made to the statement of Dr. Clemens in the board's annual report. It may be mentioned, however, that experiments in the transference of eggs from one stream to another, in the hope that the adult fish would return to the stream in which they were reared, gave negative or disappointing results. Owing to the success in the planting of the Japanese oyster in Ladysmith harbour it has been possible to make a thorough study of the various factors—tidal, seasonal and physiological—that influence growth. Through the courtesy of the Hydrographic Department it has been possible to carry out interesting observations on the ocean currents in Nootka sound and adjacent waters. It is hoped that these observations may be continued and extended.

The study of fish oils has been continued and the Prince Rupert station is now prepared to assay the vitamin D content of samples that may be submitted to them. This station is now preparing Marinol on a commercial scale and the demand for it is constantly increasing. Studies have been made of the conditions for successful refrigeration and storage and of the efficiency of refrigerated cars.

During the year a course of instruction for fishermen was given in which members of the staff of the Halifax station participated, together with representatives of the Nova Scotia Department of Agriculture and of the Department of Fisheries. The members of the staff also gave a course of instruction for foremen of lobster canneries and delivered lectures in the fisheries course conducted by Dalhousie University. On the west coast the members of the Nanaimo station gave a course of instruction for fishery inspectors. All these courses seem to have been greatly appreciated.

Two especially pleasing incidents occurred in the course of the year, the visit of a number of members of the Pan-Pacific Science Congress to the Nanaimo station, and a session of the North American Council on Fishery Investigations held at the St. Andrews station.

# APPENDIX No. III

## FISH CULTURE

### ANNUAL REPORT BY J. A. RODD, DIRECTOR

The Department of Fisheries confines its fish cultural operations to those provinces in which it is administering the fisheries, viz., Nova Scotia, New Brunswick, Prince Edward Island, and British Columbia. The operation of the hatcheries located in the National Parks in Alberta is also directed by the Department of Fisheries but at the expense of the National Parks branch, Department of the Interior. Operations by the Department of Fisheries include the propagation of the more important fresh-water and anadromous food and game fishes.

The total distribution from the hatcheries operated by this department in 1933 was 109,560,039. The numbers of each species which were distributed were:—

STATEMENT BY SPECIES, OF THE FISH AND FISH EGGS DISTRIBUTED FROM THE HATCHERIES DURING THE YEAR ENDED DECEMBER 31, 1933

Species	Green eggs	Eyed eggs	Fry	Advanced fry	Finger-lings	Yearlings and Older	Total distribution
<i>Salmo salar</i> —Atlantic salmon.....	50,300	500	3,046,111	1,600,400	15,086,083	20,188	19,803,582
<i>Salmo salar</i> —Hybrid Atlantic salmon (Atlantic—Landlocked).....						134	134
<i>Salmo salar sebago</i> —Landlocked salmon.....	2,000			40,000	44,470		86,470
<i>Salmo salar sebago</i> —Hybrid landlocked salmon (Landlocked—Atlantic).....						155	155
<i>Salmo irideus</i> —Rainbow trout.....			339,068	247,070	907,219	35,922	1,529,279
<i>Salmo clarki</i> —Cutthroat trout.....		373,790	242,724	622,000	1,158,920	553	2,397,987
<i>Salmo gairdneri</i> —Steelhead salmon.....			40,000	32,587	88,465	346	161,398
<i>Salmo gairdneri kamloops</i> —Kamloops trout.....		2,115,975	1,526,786		1,200	1,000	3,644,961
<i>Salmo leucomaenis</i> —Loch Leven trout.....			253,786	20,000	350,921		624,707
<i>Salmo fario</i> —Brown trout.....				75,000	203,818	31,478	310,296
<i>Salmo fario</i> —Hybrid brown trout (Brown trout—Atlantic salmon).....					48,059	282	48,341
<i>Salmo fario</i> —Albino brown trout.....					751	34	785
<i>Oncorhynchus nerka</i> —Sockeye salmon.....		13,372,068	47,748,775	4,081,000	4,589,191	354	69,791,388
<i>Oncorhynchus tshawytscha</i> —Spring salmon.....		418,015	1,317,270		458,328		2,193,613
<i>Oncorhynchus kenerlyi</i> —Kenerly's salmon.....		525,000	451,157				976,157
<i>Oncorhynchus kisutch</i> —Coho salmon.....		204,000	293,227			489	497,716
<i>Oncorhynchus gorbuscha</i> —Pink salmon.....	695,246						695,246
<i>Salvelinus fontinalis</i> —Speckled trout.....	60,000	36,000	155,456	787,815	5,298,866	169,533	6,507,670
<i>Cristiomer namaycush</i> —Salmon trout.....				174,810	115,344		290,154
	807,546	17,045,348	55,414,360	7,680,682	28,351,635	260,468	109,560,039

Inspections were continued with a view to locating waters where fish eggs might be obtained in sufficient quantities to warrant the establishing of collecting camps and also with a view to locating sites where the Fish Culture Service might be extended advantageously to districts that are not readily accessible from existing hatcheries.

Continued progress was made in experiments with equipment, methods and foods of various kinds at several hatcheries. The experiments and the investigations in relation to fish cultural problems that were made by the Biological Board of Canada are referred to in Appendix No. 2 of the Report of the Department of Fisheries for 1933-34.

The Fish Cultural Branch participated with units showing hatchery products and equipment in an exhibit that was made at Yarmouth, Nova Scotia.

Some 13,843 suckers, over seven and one-half tons in weight, were destroyed in Wilmot stream, which flows into Loch Lomond near Saint John, New Brunswick. Some 586 coarse fish were also destroyed in Blue and McKenzie lakes in the Princeton area, British Columbia.

Twenty-four main hatcheries, nine subsidiary hatcheries, eight salmon-retaining ponds and several egg-collecting stations were operated during 1933. The output from these establishments was as follows:—

THE FOLLOWING TABLE SHOWS THE HATCHERIES OPERATED, THEIR LOCATION, DATE OF ESTABLISHMENT, THE SPECIES AND THE NUMBER OF EACH SPECIES DISTRIBUTED FROM EACH HATCHERY DURING 1933

Estab- lished	Hatchery	Location	Species	Green eggs	Eyed eggs	Fry	Advanced fry	Finger- lings older	Year- lings older	Total distrib- ution by species	Total distrib- ution by hatcheries
1929	Antigonish.....	Fraser's Mills, N.S.....	Atlantic salmon.....				80,000	1,402,205	9,188	1,491,383	
			Brown trout.....					164,757		164,757	
			Rainbow trout.....					77,866	11,498	89,364	
1876	Bedford.....	Bedford, N.S.....	Speckled trout.....	(e)	500		40,000	695,308	75,733	811,041	2,556,555
			Atlantic salmon.....					1,239,765		1,240,565	
			Landlocked salmon.....					28,000		28,000	
			Salmon trout.....					115,000		115,000	
			Speckled trout.....					988,411		988,411	
1902	Margaree.....	N. E. Margaree, N.S.....	Atlantic salmon.....			672,220	50,000	2,240,717		2,992,937	
1912	Lindloff (a).....	St. Peters, N.S.....	Speckled trout.....					35,220	35,220	35,220	
			Atlantic salmon.....					650,000		650,000	
			Rainbow trout.....					156,040		156,040	
			Speckled trout.....					75,155		75,155	
1913	Middleton.....	Middleton, Annapolis Co., N.S.....	Atlantic salmon.....					798,400	63	798,400	881,195
1933	Nictaux Falls (d).....	Nictaux Falls, N.S.....	Speckled trout.....					603,450		603,513	1,401,913
1929	Yarmouth.....	South Ohio, N.S.....	Atlantic salmon.....			75,000		44,500		44,500	44,500
			Atlantic salmon.....					610,000	11,000	696,000	
			Kamloops trout.....					87,000	1,000	88,000	
			Rainbow trout.....					23,500	1,000	24,500	
			Speckled trout.....			12,000		399,955	93,000	504,555	1,322,085
1925	Chamcook lakes (b).....	Charlotte Co., N.B.....	Landlocked salmon.....	(e) & (f) 2,000				1,696,283		1,696,283	2,000
1928	Florenceville.....	Florenceville, N.B.....	Atlantic salmon.....				149,000	731,857	487	881,344	2,577,607
1880	Grand Falls.....	Grand Falls, N.B.....	Speckled trout.....					1,841,422		1,841,422	
			Atlantic salmon.....					905,419		905,419	
1915	Tobique (a).....	Plaster Rock, N.B.....	Speckled trout.....			471,172				471,172	2,748,841
1914	St. John.....	Saint John, N.B.....	Atlantic salmon.....			275,000	295,000	62,781		632,781	471,172
			Atlantic salmon, hybrids.....						134	134	
			Brown trout.....					39,061	890	114,950	
			Brown trout, albinos.....					751	34	785	
			Brown trout, hybrids.....					48,059	282	48,341	
			Landlocked salmon.....				40,000	16,470		56,470	
			Landlocked salmon.....								
			Hybrids.....						155	155	
			Loch Leven trout.....					20,761		20,761	
			Rainbow trout.....					27,580		27,580	
			Speckled trout.....	(e)	60,000			608,686	250	763,936	1,665,893
1914	St. John Salmon Pond.....	Saint John, N.B.....	Atlantic salmon.....	(e) & (f) 50,000			95,000			50,000	50,000
1874	Miramichi.....	South Esk, N.B.....	Atlantic salmon.....					3,854,200		3,854,200	3,968,307
			Speckled trout.....					114,107		114,107	
			Atlantic salmon.....					140,656		1,927,656	
1874	Restigouche.....	Flatlands, N.B.....	Speckled trout.....			1,195,000	592,000	112,430		112,430	2,040,085
			Atlantic salmon.....			337,719				337,719	337,719
1914	Nipisiguit (a).....	Bathurst Mines, N.B.....	Atlantic salmon.....					505,154		1,088,554	
1906	Kelly's Pond.....	Southport, P.E.I.....	Speckled trout.....					139,143		351,643	
			Cuthroat trout.....					1,017,220		1,207,220	
1914	Banff.....	Banff, Alta.....	Loch Leven trout.....			90,000		20,000		330,160	440,160
			Rainbow trout.....					228,795		485,195	
			Salmon trout.....					174,810		175,154	
			Speckled trout.....			10,000	178,885	2,545		191,430	2,499,150



THE FOLLOWING TABLE SHOWS THE HATCHERIES OPERATED, THEIR LOCATION, DATE OF ESTABLISHMENT, THE SPECIES AND THE NUMBER OF EACH SPECIES DISTRIBUTED FROM EACH HATCHERY DURING 1933

Estab- lished	Hatchery	Location	Species	Green eggs	Eyed eggs	Fry	Advanced fry	Finger- lings older	Total distrib- ution by species	Total distrib- ution by hatcheries
1928	Jasper Park (a)	Jasper, Alta.	Kamloops trout.		83,437	33,908	432,000		83,437	
			Rainbow trout.		339,068	38,944	18,275		339,068	461,449
1928	Waterton lakes.	Twin Butte, Alta.	Speckled trout.						38,944	
			Cutthroat trout.						535,553	
1916	Cultus lake.	Vedder Crossing, B.C.	Rainbow trout.		110,000	59,133			311,532	847,085
			Cutthroat trout.		73,975	4,000			169,133	
			Kamloops trout.	(e) 624,438	3,943,966				77,975	
1932	Smiths Falls.	Vedder Crossing, B.C.	Steelhead salmon.			807,000		88,465	4,508,404	4,904,223
1906	Pemberton.	Owl Creek, B.C.	Sockeye salmon.		250,000				88,811	
			Kamloops trout.			21,330,000			285,950	807,000
1917	Pitt Lake.	Alvin, B.C.	Sockeye salmon.						21,330,000	21,615,950
			Coho salmon.		19,810				489	
			Cutthroat trout.			3,002,145			19,810	
1903	Lakelse lake.	Lakelse lake, via Terrace, B.C.	Sockeye salmon.						3,201,825	3,222,124
			Cutthroat trout.			5,332,520			38,700	
1908	Babine lake.	Babine lake, via Topley, B.C.	Sockeye salmon.			4,877,587			5,432,874	5,491,574
1906	Rivers Inlet.	Rivers Inlet, B.C.	Sockeye salmon.		7,758,655	8,455,557		1,008,163	5,885,750	5,885,750
1931	T'll river (b).	Queen Charlotte Islands, B.C.	Sockeye salmon.			835,168		59,725	16,214,212	
1911	Anderson lake.	Kildonan, B.C.	Pink salmon.	(e) 695,246					894,893	17,109,105
			Sockeye salmon.		3,003,000		880,000	1,115,414	685,246	695,246
1933	Sproat river (c).	Sproat river, B.C.	Spring salmon.		323,015			180,448	4,998,414	5,178,862
1911	Cowichan lake.	Lake Cowichan, B.C.	Atlantic salmon.						323,015	323,015
			Brown trout.		20,000				20,000	
			Coho salmon.		204,000	293,227			30,589	
			Cutthroat trout.		145,000	183,591			497,227	
			Kamloops trout.		112,000	28,028			328,591	
			Loch Leven trout.			163,786			140,028	
			Spring salmon.		95,000	482,102			153,786	
1911	Kennedy lake.	Tofno, B.C.	Steelhead salmon.			40,000	32,587		745,257	2,048,065
1933	Beaver lake (a).	Kelowna, B.C.	Sockeye salmon.		1,985,975		3,201,000	2,145,934	72,587	7,332,909
1922	Lloyds creek (a).	Kamloops, B.C.	Kamloops trout.		243,442				7,332,909	7,332,909
1932	Lardo (a).	Kamloops, B.C.	Kamloops trout.		857,000	795,600			243,442	243,442
1923	Nelson.	Lardo, B.C.	Kamloops trout.		230,000	64,200			1,652,600	1,652,600
		Nelson, B.C.	Cutthroat trout.		98,980				294,200	294,200
			Kennedy's salmon.		(e) 525,000	211,907			98,980	
			Kamloops trout.		218,000	115,905		1,200	736,907	
			Speckled trout.		36,000	94,512			335,105	1,301,504
1928	Penask lake (a).	Quichena, B.C.	Kamloops trout.		265,000				130,512	265,000
1928	Summerland (a).	Summerland, B.C.	Kamloops trout.		110,000	156,224			266,224	266,224
			Kennedy's salmon.			239,250			239,250	505,474
				807,546	17,045,348	55,414,360	7,680,632	28,351,635	109,498,454	*109,560,039

(a) Subsidiary hatchery.

(b) Collecting camp.

(c) The eggs, fry and fingerlings included in this distribution, with the exceptions indicated, were from collection in the autumn of 1932, and the spring of 1933.

(c) Eyeing station.

(d) Pond and rearing station combined.

(e) Autumn collection 1933.

(f) Balance allotted to hatcheries.

HATCHERY OUTPUT, BY PROVINCES, OF EGGS, FRY AND OLDER FISH DURING  
1933

## Nova Scotia—

Atlantic salmon.....	7,883,795	
Brown trout.....	164,757	
Landlocked salmon.....	28,000	
Kamloops trout.....	1,000	
Rainbow trout.....	365,904	
Salmon trout.....	115,000	
Speckled trout.....	3,017,925	
		11,576,381

## New Brunswick—

Atlantic salmon.....	10,811,233	
Atlantic salmon (hybrids) (Atlantic salmon—Landlocked salmon).....	134	
Brown trout.....	114,950	
Brown trout, albinos.....	785	
Brown trout (hybrids) (Brown trout—Atlantic salmon).....	48,341	
Landlocked salmon.....	58,470	
Landlocked salmon (hybrids) (Landlocked salmon—Atlantic salmon).....	155	
Loch Leven trout.....	20,761	
Rainbow trout.....	27,580	
Speckled trout.....	2,777,216	
		13,859,625

## Prince Edward Island—

Atlantic salmon.....	1,088,554	
Speckled trout.....	351,643	
		1,440,197

## Alberta—

Cutthroat trout.....	1,742,773	
Loch Leven trout.....	440,160	
Kamloops trout.....	83,437	
Rainbow trout.....	1,135,795	
Salmon trout.....	175,154	
Speckled trout.....	230,374	
		3,807,693

## British Columbia—

Atlantic salmon.....	20,000	
Brown trout.....	30,589	
Loch Leven trout.....	163,786	
Coho salmon.....	497,716	
Cutthroat trout.....	655,214	
Kamloops trout.....	3,560,524	
Kennerly's salmon.....	976,157	
Pink salmon.....	695,246	
Sockeye salmon.....	69,791,388	
Speckled trout.....	130,512	
Spring salmon.....	2,193,613	
Steelhead salmon.....	161,398	
		78,876,143
		109,560,039

The experimental introduction of brown trout (*Salmo fario*) into the Cowichan and Little Qualicum rivers, British Columbia, was continued. A third allotment of 300,000 eggs for this experiment was received on January 11, 1934, from the Trout Brook Company, Hudson, Wisconsin. A second allotment of 100,000 eyed Atlantic salmon eggs was obtained through the Fishery Board of Scotland by the Game Board of British Columbia, in continuation of the latter's effort to establish early running Atlantic salmon in the province. These eggs were laid down January 13, 1934, and the resultant fry will be reared at the Cowichan hatchery, British Columbia.

The Canadian National Railway, Canadian Pacific Railway, Esquimalt and Nanaimo Railway, and the Dominion Atlantic Railway Companies continued their generous assistance and co-operation by furnishing free transportation for shipments of game fish and game fish eggs with their attendants. A similar courtesy was also extended by the Northern Alberta Railways Company.

This courtesy has been extended by the Canadian National Railway and the Canadian Pacific Railway Companies to include transportation for eggs and fish, but without attendants, on the coastal service in British Columbia. The Canadian Pacific Railway Company has also granted free transportation for

such shipments with attendants on the British Columbia lake and river service and on the steamer service between Saint John, New Brunswick, and Digby, Nova Scotia.

The extent of co-operation in 1933 is indicated in the following summary:—

Railway	Total Mileage on Trip Passes	Number of Pas- sages	Mileage Baggage Car Permits			Number of Cases or Cans			Number of Per- mits
			Full	Empty	Total	Full	Empty	Total	
C.N.R.....	4,728	39	2,874	2,604	5,478	139	120	259	47
C.P.R.....	9,650	55	8,055	7,445	15,500	288	290	578	90
E. & N.R.....	1,176	22	633	633	1,266	80	80	160	24
N.A.R.....	990	2	495	495	990	6	6	12	2
D.A.R.....	390	2	201	201	402	7	7	14	2
	16,934	120	12,258	11,378	23,636	520	503	1,023	165

NOTE.—Number of passages refers to transportation one way. A return trip is counted as two passages. Number of permits refers to one-way passage for cases or cans.

Gratifying reports regarding results that are apparent from the distribution of hatchery output continued to accumulate from all districts where this department is operating hatcheries and an increased interest is generally apparent in fish cultural operations.

In addition to results mentioned further on in this report by District Supervisors Catt and Harrison, the following results from stocking barren lakes are mentioned: Manistee lake in the Fernie district, British Columbia, was stocked with 23,500 Kamloops fry in 1925. In the spring of 1927 Kamloops averaged 24 inches long and  $7\frac{1}{4}$  pounds weight. One fish weighing 13 pounds 1 ounce was taken in September, 1927. Cahill lake near Slocan, British Columbia, received 20,000 Kamloops trout eggs in 1925 and in 1931 fish up to 15 pounds (when dressed) were taken. Haskins lake in the Kelowna district, British Columbia, received 25,000 Kamloops fry in 1927 and four years later 14-pound fish were being caught. Lillian lake near Nelson, British Columbia, was stocked with 12,500 rainbow trout eggs in 1929 and by May, 1932, specimens had attained a weight of 7 pounds. Paul lake in the Kamloops district, British Columbia, was first stocked in 1909 from Granite Creek hatchery with 5,000 Kamloops trout fry. It now supplies Lloyd's Creek hatchery with approximately 1,000,000 eggs annually. Some 6,000 fish are captured from this lake each year. Maligne lake, Alberta, stocked in 1928 with speckled trout, produced spawning fish 18 inches long in October, 1929, and by November, 1931, they were 20 inches long and weighed 6 pounds, had a depth of  $7\frac{1}{2}$  inches and a girth of 16 inches. Clear lake in Charlotte county, New Brunswick, was stocked in 1925 and subsequent years with rainbow trout from Saint John hatchery. In 1929 rainbow 24½ inches long weighing 4½ pounds were caught. Alderson lake, Alberta (6, 1, 30 W. 4), received cutthroat fry in 1928. These had attained a growth of 10 to 14 inches by 1931 and weighed 2 pounds. Marvel lake, Alberta (22, 12, W. 5), had cutthroat introduced in 1926 and by 1933 they were 25 inches long and 6 pounds in weight. Herbert lake, Alberta, (T. 29, R. 16), received cutthroat fingerlings in 1930. They were 8 to 14 inches long by September, 1932.

The Director of Fisheries for Alberta advised in August, 1933, that excellent results were apparent, notably in the Bow, the Highwood, Willow creek and the Crowsnest river, from the introduction of rainbow trout into the foothill streams south of Calgary; that excellent rainbow trout fishing was being enjoyed in the Bow river from Calgary to about six miles east of Carseland, fish up to 4½ pounds being taken quite frequently in this part of the river, which was practically barren of trout before the rainbow were introduced; in the Highwood



for about thirty miles east of High River, where previously no trout were caught, rainbow up to 4 pounds in weight were taken, with many averaging  $2\frac{1}{2}$  pounds each, and that angling almost equally as good was enjoyed in Willow creek and the Crowsnest river.

In many districts private individuals and local organizations, such as fish and game clubs, angling and protective associations, boards of trade, service clubs, etc., have provided transportation for the distribution of hatchery product in local waters and have otherwise assisted in fish cultural work. In general the interest shown in co-operative fish culture has greatly increased. Several rearing ponds, some of them on a rather extensive scale, have been constructed. Construction costs have been borne by the local organization interested, in some instances assisted by the provincial government. The department has furnished biological, fish cultural, and engineering advice when requested in all instances prior to development, and it has also supplied eggs or fry up to the capacity of the respective ponds. The Avon River Power Company has continued its cordial assistance and co-operation in the operation of the Nietaux salmon retaining pond.

Officials and employees of other federal departments, provincial officials, and officers and crews of fishery patrol and protection boats, and other branches of this department have cordially co-operated in all instances where they could be of assistance. The Research Committee of the Biological Board has continued its courteous consideration of all fish culture problems that were referred to it.

From the autumn collection of 1932 various exchanges of eyed eggs were made with the United States Bureau of Fisheries, details of which are given in a subsequent statement.

## MARITIME PROVINCES, EASTERN DIVISION

### *District Supervisor of Fish Culture, James Catt*

Distributions as a whole from the several Maritime Province hatcheries were very satisfactory during the past season. In certain cases the stock liberated showed a marked improvement over the previous year.

The collection of speckled trout ova this season surpassed anything heretofore achieved in this division.

Atlantic salmon egg collections were below normal, due to a most unusual series of fall freshets with intervals of very cold weather.

Storms and freshets damaged the Miramichi retaining pond to such an extent that the majority of the impounded fish escaped. Heavy spates destroyed the fish trap at Margaree Harbour and twice washed out the retaining fence at River Philip. Floods also covered the Sackville river trap and fence and rendered them ineffective for considerable periods.

Notwithstanding bad weather conditions, a good collection of landlocked salmon eggs was made at Chamcook lake, New Brunswick. This was not the case at Grand lake, Nova Scotia, where freshets, after breaking the main fence on the Shubenacadie river, remained so high that for weeks the surface of the stream was at least eighteen inches over the top of the fence.

To the existing lists of waters proven to have been greatly benefited by stocking, at least two new areas may be added. They are Giant's lake, stocked with rainbow trout from Antigonish hatchery, and Hart's lake, stocked with speckled trout from Bedford hatchery. In the latter case many of the fish have descended into the headwaters of the Wallace river. Hart's lake received 2,500 speckled trout fry in 1931 and 30,000 in each of the years 1932 and 1933. In 1933 some of the trout caught in the lake were 19 inches long and in a spawning condition. Yearlings were 6 to 7 inches long. Giant's lake received its first

stocking in 1931. In 1933 large numbers of rainbow fingerlings, the result of natural propagation of the two-year-old stock, were seen by the inspecting officer while the largest of the two-year-old fish observed had an estimated weight of over 3 pounds. The size of many trout taken in the increased catch on the Antigonish rivers indicates that there can be no reasonable doubt as to their hatchery origin. In the small privately owned pond near Saint John, known as Ray's lake, the brown trout are doing well. One specimen over 6 pounds in weight was captured there in the summer of 1933. Many specimens of  $1\frac{1}{2}$  to 2 pounds were also taken. The speckled trout stock in this water continues to hold its own. Woodard lake below Pennfield in Charlotte county has yielded excellent returns from the speckled trout liberated in it from St. John hatchery. The fish have made a quick growth and specimens up to 4 pounds 3 ounces in weight have been reported.

An extended investigation to locate sites for natural fingerling and brood stock ponds was made particularly in southwestern Nova Scotia. These investigations entail a great deal of work as every mile of a suitable stream must be examined, providing that it conforms to accessibility requirements. Some records of flow and temperatures during the warm weather must also be made.

Natural brood ponds made by dams on the headwaters of the Tusket were investigated. These ponds were not all established with the intention of improving angling, but as storages for small lumbering operations, etc. They carry great quantities of trout. It is of interest to note that, when the water was run off the flowage areas of these ponds, no fish were trapped, and nearly all the larvae of aquatic insects appeared able to retreat to deeper water from the drying zones. This was due to the slow rate at which the ponds were lowered.

In Sullivans, Payson's and Klondike flowages (the natural ponds mentioned above), large numbers of well-conditioned speckled trout were found to be inhabiting water of a pH below 5.4.

The Saint John branch of the New Brunswick Fish and Game Protective Association, in conjunction with the Loch Lomond Protective Association, established a natural rearing pond for speckled trout on Stevenson's brook, Loch Lomond, a site suggested by the writer to Doctor A. G. Huntsman. The associations mentioned above spent a considerable sum of money in purchasing the necessary land and building a suitable dam to flood it. The pond, completed late in the fall, covers about 15 acres and has been stocked with large speckled trout fingerlings from the St. John hatchery.

At St. Stephen the local branch of the provincial association built a pond about one-quarter of an acre in area. This pond was deepened and cleaned in the autumn of 1933.

The St. Andrews branch of the New Brunswick Fish and Game Protective Association established a small rearing pond 150 feet by 5 feet on a spring brook feeding Limeburner lake. This water was stocked with 2,000 speckled trout fingerlings. In the fall, 500 of these fingerlings averaging three inches in length were liberated in Limeburner lake. A number of fish were left in the pond in order that their actions during the winter might be observed. Notwithstanding continued sub-zero weather, the pond was still open on December 19. It is to be enlarged during the coming season when it will also be covered with wire as a protection against kingfishers.

A small allotment of fingerlings was placed in a 20 by 8 foot pond on the brook feeding Bonaparte lake. The fish appeared to thrive without being fed, but unfortunately an early freshet destroyed the pond, which will not be rebuilt.

An examination was made of a number of pond sites suggested by the Fredericton and Moncton branches of the Provincial Protective Association. None of them however fulfilled requirements. Additional sites suggested by the secretary will be examined next spring.



The Nova Scotia Fish and Game Protective Association through Doctor Fales, in conjunction with the Provincial Government of Nova Scotia and divers municipal bodies, completed a group of rearing ponds for landlocked salmon at the head of Grand lake, Nova Scotia. As these ponds were completed late in the year, they have not yet been used.

The co-operation of the Chief Supervisor of Fisheries, and some of his officers, provincial officers, and divers branches of the fish and game protective associations in New Brunswick and Nova Scotia has in many ways benefited the department's fish cultural branch and is greatly appreciated.

The department's staff in its several Maritime establishments as a whole rendered excellent service. They displayed interest and intelligence in carrying out their duties.

#### ANTIGONISH HATCHERY

*K. G. Shillington, Superintendent*

An excellent distribution was made of Atlantic salmon, speckled trout, rainbow trout and brown trout fry and fingerlings, also some Atlantic salmon, rainbow and speckled trout yearlings.

The best previous collection of speckled trout eggs at any hatchery in the Maritimes was greatly exceeded; the brood stock of this species at this establishment produced 7,026,668 eggs.

Two new ponds of the circular type were constructed close to the river bank. They are operating most successfully and, at the end of 1933, carried several thousand speckled trout fingerlings from 7 to 8 inches in length.

The superintendent introduced an interesting innovation in the form of a movable spawning shelter. This is moved over the ponds where stripping operations are being carried out and permits this work to be done under comfortable conditions even in the coldest weather. Heavy spates prevented a good collection of speckled trout eggs at Lochaber lake, the streams in the district overflowing their banks as well as the traps and fences in them.

Selective breeding was practised at this establishment. Breeding from hatchery-reared stock of speckled trout produced fingerling fish bigger than those produced from eggs obtained from trout that had come to the spawning stage in their natural habitat. Weights of 100 fingerlings were taken in September—those produced from wild stock (Lochaber lake) weighed  $7\frac{1}{4}$  ounces while those from selected parents reared at the hatchery weighed  $50\frac{1}{2}$  ounces.

During the season the following numbers of eggs were collected by the staff of this hatchery: Speckled trout, hatchery ponds, 7,026,668; Lochaber lake, 61,625; South river (sea-run variety), 4,455; Atlantic salmon, South river, 32,200; rainbow trout, hatchery ponds, 22,960. The following numbers of eggs were also received: 75,000 rainbow trout and 188,300 brown trout from Saint John; 1,638,000 Atlantic salmon from River Philip. Outgoing shipments were: 250,000 speckled trout to Yarmouth; 100,000 speckled trout to Lindloff and 200,000 Atlantic salmon to Lindloff. The distributions were: Atlantic salmon 1,491,393, speckled trout 811,041, rainbow trout 89,364, and brown trout 164,757.

#### BEDFORD HATCHERY

*George Heatley, Superintendent*

A good distribution of fingerlings, larger than that of any previous year, was made from the Bedford hatchery during the past season.

An effort to collect landlocked salmon eggs in the Grand lake district was not successful. This, however, could not be avoided in view of the unusual freshet conditions that obtained generally throughout the Maritime Provinces



last autumn. The apron, piers and fence which were erected in the Shubenacadie river near the outlet were entirely covered by the flood water, which also covered some area on both banks of the river, although the fence was built slightly above ordinary high-water mark. A trap was also installed in the upper part of the fish ladder in the new dam that was built at Fletcher's run at the upper end of Grand lake.

For the same reason, a smaller collection of Atlantic salmon eggs, namely 842,600, than that of the preceding year was made in the Sackville river near Bedford. A fence was erected in the channel leading to Roy's pond to prevent the fish passing around the dam, and horizontal racks were installed over the apron of the main dam. These precautions proved quite satisfactory until the entire area was completely flooded in the early part of October. Large numbers of fish were in evidence in Bedford basin prior to the freshets, but during the high water, the fences and barriers above referred to were no obstruction to the upstream passage of the fish. These were completely flooded and the water rose to such a height that boats were used as a means of transportation on at least one of the roads adjacent to the river.

A considerable amount of work was done to the canal which was used as a retaining pond for parent salmon, and eight concrete rearing ponds were constructed on the hatchery grounds.

Due to distributions from this hatchery, excellent fishing is now enjoyed in Hart's lake on the borders of Colchester and Cumberland counties. Previous to these introductions, this lake contained no speckled trout.

The following supplies of eggs were laid down in the Bedford hatchery during 1933: Atlantic salmon, Sackville river, 842,600; River Philip, 791,000; speckled trout, Antigonish hatchery, 1,000,000; Loch Leven trout, Bozeman, Montana, 302,000; landlocked or sebago salmon, Saint John, New Brunswick, 75,000.

Distributions for the season were: Atlantic salmon, 1,240,565; salmon trout, 115,000; speckled trout, 988,411; landlocked salmon, 28,000.

#### MARGAREE HATCHERY

*L. J. Burton, Superintendent*

A small collection of 73,940 speckled trout eggs was made in the hatchery ponds. Two million and ninety-two thousand Atlantic salmon eggs were received in November and December from the Margaree salmon pond, and 800,000 in February from the Kelly's Pond hatchery.

Distributions for the season were: Atlantic salmon, 2,962,937; speckled trout, 35,220.

#### LINDLOFF HATCHERY

*J. C. Goswell, Officer in Charge*

Lindloff hatchery, subsidiary to Margaree, received the following eggs, all in the eyed stage: 500,000 Atlantic salmon from the Miramichi hatchery and 200,000 from the Antigonish hatchery; 200,000 rainbow trout from the Saint John hatchery; 100,000 speckled trout from the Antigonish hatchery. Distributions were: 650,000 Atlantic salmon; 156,040 rainbow trout; 75,155 speckled trout.

For the first time, speckled trout fingerlings were reared at this establishment. Considerable trouble was experienced in maintaining an adequate water supply in the long earthen ponds. This was due to recurring leaks in the old mill dam. This difficulty has been overcome.

## MARGAREE SALMON RETAINING POND

*J. P. Chiasson, Superintendent*

For the second successive year, early running, or June, salmon were purchased from the commercial nets outside the Margaree harbour and retained in a pound-net pot in the harbour during the summer months. The percentage of loss was very low and there was a vast improvement over the results that were obtained during the previous year in the permanent pond at Buckle's cove. One hundred and eighty-eight early fish were impounded, of which 176 were stripped in the autumn. The balance of 12 did not all die but were liberated on showing signs of increasing distress shortly after their capture. One hundred and thirty-six salmon were also taken in the autumn but, as elsewhere, heavy freshets proved a great handicap, putting the trap out of commission and damaging it to such an extent that it could not be replaced. Early running salmon, 176 in number, produced 1,019,000 eggs, and late running 1,073,000, all of which were laid down in the Margaree hatchery.

## MIDDLETON HATCHERY

*F. M. Millett, Superintendent*

A satisfactory distribution was made from the Middleton hatchery and many favourable comments have been heard on the result of its operations. It was from this plant that speckled trout were distributed in Romsey, Sand, Lily, Waterloo, and Elliott lakes, in which excellent catches have been taken during the past season. Fish of 5 pounds in weight are reported from Romsey lake.

During 1933, 1,045,500 Atlantic salmon eggs were received from Nictaux pond, 280,500 from River Philip camp, and 772,000 speckled trout eggs from the Antigonish hatchery.

The general public is taking a greatly increased interest in its operations and the Fish, Forest and Game Protective Associations are co-operating. An increased number of applications is being received each year and, while it is impossible, owing to the large territory that this hatchery covers, to distribute the numbers that the department would like to, yet in most of the waters stocked the fishing is reported as being improved. A larger run of smolt is reported, particularly in the Nictaux and Annapolis rivers. Distributions were: Atlantic salmon, 798,400, and speckled trout, 603,513.

## NICTAUX SALMON RETAINING POND

*J. W. Heatley, Officer in Charge*

The run of Atlantic salmon that passed the Nictaux falls to the Nictaux salmon retaining pond in 1933 was considerably smaller than the runs of the two previous years. All were captured and held in excellent condition until the autumn. These fish yielded an unusually large number of first-class eggs, the quantity obtained being nearly double the number that was expected on the basis of the last two seasons. The total collection of 1,045,000 was laid down in the Middleton hatchery.

Twenty outside rearing troughs supplied with water from the canal were installed below the power dam. These troughs gave excellent results, producing 28,000 No. 2 and 16,500 No. 3 Atlantic salmon fingerlings.

## RIVER PHILIP EGG COLLECTING CAMP

*F. M. Millett, Superintendent*

The discarded upper dam that was one time operated by the Oxford Light and Power Company with its fishway is used for the capture of parent salmon

at this point. As this dam is not in regular use, it is not kept in repair and considerable work was necessary in removing debris from the fishway, erecting fences and otherwise preparing for the season's collection of eggs. All preliminary work of this nature was done by Superintendent Heatley of the Bedford hatchery. The capture of parent fish and the collection of eggs was undertaken by Superintendent Millett of the Middleton hatchery. As elsewhere in the Maritime Provinces, this work was done under very adverse weather conditions. Repeated heavy freshets, with intervals of extremely cold weather, rendered the operations very difficult. The retaining fence was washed away twice, and over 1,000 fish taken early in the season escaped when the river flooded out that portion of the canal which is used as a retaining pond. For eight days during the heaviest part of the run, the stream was so high that the Oxford dam presented no barrier to ascending fish, which merely swam over it instead of going into the trap. It is estimated that at least 5,000 salmon reached the headwaters. In spite of these difficulties, 865 salmon were retained in the pond and stripped. The resultant collection of eggs, namely 4,635,900, which creates a record for this station, was distributed as follows: To Antigonish hatchery, 1,638,000; Bedford, 791,000; Middleton, 280,500; Yarmouth, 748,000; Miramichi, 1,178,400.

#### YARMOUTH HATCHERY

*H. V. Gates, Superintendent*

The general output from the Yarmouth hatchery was good, a larger number of yearling and older fish being produced than at any other hatchery in the Maritime Provinces. The hatchery ponds produced 413,000 speckled trout eggs and 3,000 rainbow trout eggs, which were supplemented by 200,000 rainbow trout eyed eggs from the Cape Cod Trout Company, 250,000 speckled trout eyed eggs and 935,000 speckled trout green eggs from the Antigonish hatchery, 748,000 Atlantic salmon eggs, green, from the River Philip pond and 750,000 speckled trout eggs, eyed, from the American Fish Culture Company.

While the concrete ponds of this hatchery have yielded excellent results in raising large quantities of fingerlings and yearlings, they have not been as successful in producing adult trout of good quality. Consequently, the hatchery brook was subdivided into a series of ponds in which the adult fish appeared to thrive better.

While no proof exists that this year's improved speckled trout angling in the Yarmouth district was the outcome of hatchery stocking, yet there can be no reasonable doubt that such was the case. Members of the Yarmouth branch of the Nova Scotia Fish and Game Protective Association expressed themselves as being delighted with the improved early trout fishing.

An exhibit of live fish was made at the Yarmouth Exhibition, September 27 to 29 comprised of Atlantic salmon, rainbow and speckled trout in various stages of development from fingerlings to four-year-old fish.

Distributions for the season were: Atlantic salmon, 696,000; speckled trout, 504,585; rainbow trout, 120,500; Kamloops trout, 1,000.

#### FLORENCEVILLE HATCHERY

*George Sutherland, Superintendent*

Three hundred thousand eyed speckled trout eggs, originally purchased from the Cape Cod Trout Company, were transferred to this hatchery from Grand Falls in February. Two hundred and fifty thousand were also received from the American Fish Culture Company in December. One million two hundred and ninety-eight thousand eight hundred and twenty-four Atlantic salmon



eggs were received from the Saint John pond in November, and up to December 31, 957,266 speckled trout eggs were collected in the hatchery ponds.

Distributions for the season were: Atlantic salmon, 1,696,283; speckled trout, 881,324.

#### GRAND FALLS HATCHERY

*W. A. McCluskey, Superintendent*

The operations at this establishment continue to improve. A late output of salmon fingerlings was of exceptionally fine quality. The Superintendent made an initial but satisfactory collection of 393,316 speckled trout eggs in Three Brooks deadwater, the property of Mr. Donald Fraser of Plaster Rock. Collecting operations were carried on under extremely bad weather conditions, the freshets of early October being followed by snow and ice the latter part of the month. The department supplied an experienced hatchery man. Mr. Fraser supplied retaining crates and such assistance as was needed. The department transported the eggs to Grand Falls hatchery, where they were eyed, and purchased 200,000 of these eggs from Mr. Fraser when they had reached the eyed stage. The balance will be retained at the hatchery until they are free-swimming fry, when they will be placed at Mr. Fraser's disposal to be distributed in the ponds or otherwise disposed of by him. Three hundred thousand speckled trout eggs were received in February from the Florenceville hatchery and 1,000,000 in December from the American Fish Culture Company. The season's supply of Atlantic salmon eggs from the Saint John pond, namely, 1,270,260, were received in October and November. Distributions amounted to: Atlantic salmon, 1,841,422; speckled trout, 905,419.

#### TOBIQUE HATCHERY

*R. O. Barrett, Officer in Charge*

The Tobique hatchery, subsidiary to Grand Falls, which was established to facilitate the distribution of salmon in the Tobique river, which is the most important spawning tributary of the St. John river system, received its supply of salmon eggs, 600,000, from the Miramichi hatchery. Of this number 471,172 were hatched and distributed.

#### MIRAMICHI HATCHERY AND SALMON RETAINING POND

*Frank Burgess, Superintendent*

An effort was made for the second consecutive season to retain early or June salmon in the pond that had been dredged the previous year in the hatchery brook near its outlet to the Miramichi river. Twenty-five selected salmon were purchased from commercial fishermen and placed in this enclosure between June 5 and 15. Although the greatest care was exercised in selecting the fish and they were placed in the pond in apparently perfect condition, none of them survived until the autumn. In accordance with the usual practice, 1,712 salmon secured by tender and contract from commercial fishermen were placed in the pond between September 12 and October 23, but unfortunately a high tide accompanied by a very heavy northeast October gale caused the retaining fence to move slightly, but to a sufficient extent to permit most of these fish to escape. This occurred so late in the season that it was impracticable to secure other salmon as they had at that time dispersed to the spawning grounds at the headwaters of the Miramichi and its numerous tributaries. The collection of eggs, amounting to 1,002,128, was consequently very much smaller than that of recent years. This collection was supplemented by

receipt of 1,178,400 Atlantic salmon eggs in November from River Philip camp. Through an exchange agreement with the United States Bureau of Fisheries 1,000,000 Atlantic salmon eggs were shipped to Craig Brook hatchery, Maine, on February 28. Other outgoing shipments of eyed eggs of this species in March and April were: To Tobique hatchery, 600,000; Lindloff hatchery, 500,000; Restigouche hatchery, 600,000.

Distributions were: Atlantic salmon, 3,854,200; speckled trout, 114,107.

#### NEW MILLS SALMON RETAINING POND

*Wm. White, Superintendent*

Largely on account of a run of female salmon smaller than usual the egg collection at the New Mills pond was slightly below normal.

Considerable trouble was experienced in keeping the salmon in good condition in the pond during August. A drought at this time entirely dried up the feeder brook. This condition was aggravated by a run of neap tides which for some days did not reach the pond at high water. When the first fish showed signs of distress an attempt was made to improve conditions by removing part of them to pontoons which were to be moored in sea water. This proposal was found to be impracticable because sea water of sufficient depth to insure coolness could only be found in exposed portions of the bay. The total loss of salmon was not, however, nearly as great as was feared, or as might have been expected when the conditions were at their worst. The loss of twenty-eight during the season is attributed to unfavourable water conditions in the pond, and the loss of twelve to the effect of injuries. Four hundred and eighty-seven salmon purchased from the commercial fishermen of the district were placed in the pond from May 24 to July 8. The total yield of 1,350,131 eggs was laid down in the Restigouche hatchery.

#### RESTIGOUCHE HATCHERY

*W. A. Mowat, Superintendent*

Under unusually cold weather conditions, a small collection of speckled trout eggs amounting to 53,774 was made at Black lake near Campbellton. While the size of this collection was much smaller than had been anticipated, the parent fish were of unusually fine quality. From Miramichi hatchery 600,000 Atlantic salmon eyed eggs were received in March and in April 593,670 of these were shipped to the subsidiary hatchery at Nipisiguit. In October and November 1,350,131 Atlantic salmon eggs were received from New Mills salmon pond.

Distributions were: Atlantic salmon, 1,927,656; speckled trout, 112,430.

#### NIPISIGUIT HATCHERY

*J. T. Comeau, Officer in Charge*

The Nipisiguit hatchery, subsidiary to Restigouche, which was primarily established to facilitate the stocking of the Nipisiguit river, received 593,670 Miramichi river eggs from the Restigouche hatchery. The distribution amounted to 337,719 Atlantic salmon.

#### SAINT JOHN HATCHERY

*J. D. Nichol, Superintendent*

This hatchery had a very satisfactory season. Included in the distributions was a group of speckled trout fingerlings of a size and quality not previously equalled at Saint John. They were liberated in the natural rearing pond on

Stephenson's brook, recently completed by the Loch Lomond Protective Association and the Saint John branch of the New Brunswick Fish and Game Protective Association.

A small but valuable group of two-year-old salmon (*Salmo salar* crossed with *Salmo salar* sebago) from one-quarter pound to one-half pound in weight were liberated in Chamcook lake on October 19. These hybrids were produced in two ways, namely crossing the Atlantic male with the sebago female and crossing the Atlantic female with the sebago male. Before liberation, one group was marked by removal of the adipose fin and the other by removing the left pectoral and adipose fins. Three specimens were caught later in the season.

The demand from this district for speckled trout is annually increasing. At the request of local interests the brown trout brood stock, which was developed for the purpose of establishing the species in Loch Lomond, was liberated, thus affording greater space for the production of speckled trout fingerlings and adults.

The Fish and Game Protective Association rendered valuable aid in distributing the season's output by supplying guides, boats, and other assistance.

A collection of eggs in the autumn was made under rather difficult conditions due to early snow and frost, which entailed removal of ice from the ponds before the fish could be captured.

The following supplies of eggs were obtained from the hatchery ponds: Speckled trout, 1,169,146; brown trout hybrids, 27,136; Loch Leven trout, 2,340; brown trout albinos, 7,256; rainbow trout, 424,870.

Rainbow trout eggs were eyed and 200,000 transferred to Lindloff hatchery and 75,000 to Antigonish hatchery. Other outgoing shipments were: 75,000 sebago salmon to Bedford hatchery; 188,300 brown trout to Antigonish hatchery; 65,010 speckled trout, Atlantic and landlocked salmon to the Biological Station at St. Andrews, New Brunswick.

The collection of landlocked or sebago salmon eggs was continued in the Chamcook lakes under the direction of Assistant R. O. Barrett of the Grand Falls hatchery, who made observations over the whole of the upper lake and a portion of the lower lake, which resulted in the locating of six spawning beds in the upper and two in the lower lake.

One hundred and sixty-four fish were caught as compared with 156 last year. From these 279,290 eggs were obtained, of which 277,290 were transferred to the Saint John hatchery and 2,000 to the Atlantic Biological Station at St. Andrews.

On October 31, 823,556 Atlantic salmon eggs were received from the Saint John salmon pond.

Distributions for the year were: Atlantic salmon, 632,781; Atlantic salmon hybrids, 134; brown trout, 114,950; brown trout albinos, 785; brown trout hybrids, 48,341; landlocked salmon, 56,470; landlocked salmon hybrids, 155; Loch Leven trout, 20,761; rainbow trout, 27,580; speckled trout, 763,936.

#### SAINT JOHN SALMON RETAINING POND

*J. D. Nichol, Superintendent*

The collection of salmon eggs at the Saint John pond was rather disappointing, largely due to the heavy loss of salmon caused by unfavourable conditions during the warm weather. The yield of the females that were stripped was also below the average. The first salmon was placed in the pond on May 29 and the last on June 24, a total of 1,215 being impounded. The collection of 3,442,640 eggs, which was approximately one-half that of last year, was distributed as follows: Florenceville hatchery, 1,298,824; Grand Falls hatchery, 1,270,260; Saint John hatchery, 823,556; Biological Board, St. Andrews, New Brunswick, 49,000; Biological Board, Toronto, Ontario, 1,000.



## KELLY'S POND HATCHERY AND MORELL SALMON RETAINING POND

*F. C. Hayley, Superintendent*

Thirty-four thousand eyed speckled trout eggs were purchased from the Ings private hatchery in April. In the following autumn the collection of speckled trout eggs was confined to the hatchery and Ings pond. In the case of the former, the work was done by the hatchery staff, and in the latter by the proprietor. Ings pond supplied 124,200 eggs, which will be paid for in 1934 on the basis of number of eggs that eye. Three hundred trout were caught with rod and line and retained in a small pond below the dam at the hatchery until ripe and 79 were taken in trap on brook at head of pond. Forty-seven thousand four hundred and forty-one eggs were secured. It was proposed to liberate these fish in lake Verd and Sherrys brook, but, owing to road conditions, this was found to be impractical after the fish were stripped. They were consequently returned to the hatchery pond. In February 800,000 Atlantic salmon eyed eggs were transferred to Margaree hatchery.

Operations at the Morell salmon retaining pond were in charge of Assistant A. Tait. The trap and retainers were in place by October 1 and, although a few fish had already ascended, 1,124 salmon were captured between October 11 and November 13. Of this number 441 were surplus males and were liberated unstripped between November 7 and December 4 above the trap. Six hundred and seventy-one fish were stripped and yielded 2,720,600 eggs, which were all laid down in Kelly's Pond hatchery.

Unusually cold and stormy weather and high tides were experienced and the river was frozen over almost continuously throughout stripping operations. This made the work of lifting the nets and handling the fish very difficult so it became necessary to remove the fish to wooden crates on November 16.

Distributions made were: Atlantic salmon, 1,088,554; speckled trout, 351,643.

## WESTERN DIVISION

*District Supervisor of Fish Culture, C. W. Harrison*

The run of sockeye salmon to the coastal waters of British Columbia in the season 1933 was disappointing. This condition was reflected in the collections of eggs at all but one sockeye salmon hatchery in the province. Rivers Inlet establishment secured its full quota but the total collection of sockeye salmon eggs at all stations where this variety of Pacific coast salmon is handled was 52,925,300, as against 113,970,724 and 87,277,285 eggs, respectively, in the brood years of 1928 and 1929.

Had all conditions been favourable, natural reproduction in conjunction with the huge artificial assistance given in the brood years should have produced a far greater return of adult sockeye salmon in the 1933 season. That unknown part of their life spent in salt water was apparently responsible for a huge loss, which might explain the pack of 1933.

Spring salmon collections were secured and laid down in Cowichan lake, Rivers Inlet, Anderson lake hatcheries and Sproat River eyeing station. The total number of eggs of this variety obtained was 1,737,885 as compared with 2,525,340 in 1932 and 2,156,150 in 1931. In this connection there were noticeable decreases in the numbers secured at the two first-named stations and increases in the collections at Anderson and Sproat river establishments.

A collection of coho salmon eggs numbering 1,044,000 was also laid down in Cowichan lake hatchery.

During the past year a number of experiments in connection with fish culture was conducted at different establishments in the province as follows:—

Tests to determine whether the use of trough riffles gave better results than troughs operated without such equipment.

Tests of this nature made at Smiths Falls hatchery in 1931-32 by officers of the Biological Board would indicate that the best results are secured by the use of riffles. Later experiments conducted by hatchery officers would appear to indicate that there is very little difference in results obtained as between the two methods when the troughs are carrying a light or normal load of eggs, although it is generally conceded that a distinct benefit is derived from the use of riffles when heavy loads of eggs are carried or a subnormal oxygen saturation of the water supply is the case.

Another interesting experiment that was undertaken at Cultus lake, Rivers Inlet and Smiths Falls hatcheries was to determine whether or not there is any change in size of sockeye salmon eggs during the period of incubation between the time they are laid down as water-hardened eggs and when they are near the point of hatching out. The results secured by the several officers conducting this experiment show a distinct change in the number of eggs that the same measure will hold at the beginning and the end of the period in question. In all instances the measures were found to hold a smaller number of eggs of the same species at the end than they did at the beginning of the period, which demonstrates the necessity for accurate counts of the contents of the measure to be used when eggs are received or shipped at different stages of development.

Another interesting experiment that was undertaken at several hatcheries was to determine what becomes of eggs that remain in sockeye salmon that are liberated after they have been stripped by the expression method. This experiment was conducted at Kennedy lake, Anderson lake, Rivers Inlet, Pemberton and Babine lake hatcheries.

At the first-named station, eight pairs of sockeye salmon were placed in separate enclosures, the females having first been stripped by hand pressure, and were left therein undisturbed until they were dead. After death the females were cut open and all eggs remaining in them were counted. Later the gravel in each enclosure was carefully examined and all eggs found, both dead and alive, were recorded. The same procedure was followed at each of the other stations mentioned but with varying numbers of fish to suit the available accommodation. The following tables give the results obtained at each station mentioned above:—

## KENNEDY LAKE HATCHERY

Enclosure Number	Number Females	Eggs in fish after death	Recovered from Gravel	
			Alive	Dead
1.....	1	16	613	98
2.....	1	598	540	33
3.....	1	411	1,497	50
4.....	1	28	480	10
5.....	1	39	380	23
6.....	1	12	800	280
7.....	1	80	969	202
8.....	1	662	19	219
	8	1,846	5,298	915

## ANDERSON LAKE HATCHERY

1.....	1	48	181	48
2.....	1	297		
3.....	1	37	284	6
4.....	1	56	94	8
	4	438	559	62

## DEPARTMENT OF FISHERIES

## RIVERS INLET HATCHERY

Enclosure Number	Number Females	Eggs in fish after death	Recovered from Gravel	
			Alive	Dead
2.....	1	11	287	16
3.....	2	36	347	47
4.....	1	33	108	6
5.....	1	6	71	131
	5	86	813	200

## PEMBERTON HATCHERY

1.....	1	54	85	13
2.....	1	6	61	6
3.....	1	67	26	7
4.....	1	212	22	12
	4	339	194	38

## BABINE LAKE HATCHERY

1.....	1	21	64	11
2.....	1	174	18	2
	2	195	82	13

A general survey of the above would seem to show that hand-stripped sock-eye when liberated proceed to complete their spawning probably as well as sock-eye that have never been handled.

In accordance with the program for the introduction of brown trout to streams on Vancouver Island, 300,000 eggs were received from Montana in December, 1932, and the resultant fingerlings marked and liberated in the waters of the two streams selected, namely, Cowichan and Little Qualicum. These fish were liberated in the spring and averaged 5 inches in length. Specimens captured last fall in the vicinity of the Cowichan hatchery had attained a length of 9 to 10 inches.

The Provincial Game Commission secured 100,000 Atlantic salmon eggs from Scotland, and having no facilities of its own at the time to take care of incubation and distribution, the eggs were laid down in Cowichan lake hatchery. A part of the resultant fry was liberated in the Cowichan lake system when at the free swimming stage of development; the remainder was retained and fed in ponds through the winter of 1933-34 and will be released in the spring or early summer of 1934.

The results secured from the small retaining tank installed at Cultus lake hatchery in 1932 were particularly gratifying. Originally 19,600 steelhead fry were placed therein, and periodically during the summer and fall of 1932, this number was reduced as conditions demanded. Four thousand were retained through the winter and liberated in early summer of 1933. These had then attained a length of five to seven inches. The results were so satisfactory that the Provincial Game Commission, who contemplated the establishment of a rearing station at Stanley park, decided to alter their original plans and install a battery of these small tanks. This plant was designed by the fish cultural branch of the department and its engineer supervised construction; also an experienced fish cultural officer was loaned to the Commission for about three



and one-half months to conduct operations until it could secure a competent man to take his place. The department also supplied 100,000 Kamloops trout eggs and 25,000 steelhead advanced fry. The first named were transferred from Penask lake hatchery and the latter from Cowichan lake hatchery.

In the spring of 1933, under the direct supervision of the department's engineer, the Provincial Game Commission rebuilt the retaining pond system at Qualicum. Five ponds of similar design to those in operation at Cowichan lake hatchery were constructed. An arrangement was made whereby the Commission agreed to place four of these ponds at the disposal of the department for the purpose of rearing the brown trout fry allotted to the Little Qualicum river in return for the loan of two ponds at Cowichan lake hatchery for rearing Atlantic salmon fry. The Commission assumed all expense in connection with the Qualicum operations and this department in a similar manner cared for the Atlantic salmon at Cowichan.

The Provincial Game Commission has been most appreciative of the assistance and co-operation afforded by this department in connection with the development of its fish cultural service.

Unfortunately, owing to adverse climatic conditions which were responsible for the complete disorganization of the water supply of the Lardo hatching station, it was impossible to operate this establishment as contemplated, and as an alternative floating hatching baskets were provided, but owing to all streams in the district being in freshet condition, the results obtained from this method of incubation were not at all that might be desired.

In accordance with the urgent request of interested anglers, a more intensive program of fish cultural operations was initiated at Beaver lake, near Kelowna, British Columbia. The work done was of an experimental nature to determine the future possibilities for securing a satisfactory collection of Kamloops trout eggs that would justify a continuation of operations in future seasons on a much larger scale.

Although the attempt was not quite as successful as expected, it was sufficiently encouraging to justify a continuation of these operations this coming season on a somewhat larger scale, and to ensure greater success, considerable preliminary work was done in connection with clearing streams and construction and installation of more reliable traps and fences.

In recent years the Department of Fisheries, through its Fish Cultural branch, has increased extensively its activities in connection with sporting fish operations. Improved travelling conditions in British Columbia and fairly easy access to many bodies of water that previously were difficult to reach, and also as a greater attraction to the very valuable tourist trade, has made it imperative that many lakes that previously were in isolated positions should receive artificial assistance to ensure the maintenance of their fish population.

Splendid success has been achieved by transferring sporting fish eggs and fry from lakes and streams where there was an overabundance of native stock, to many other bodies of water that required such efforts to supply the demands of the public. Each year unassailable evidence has been forthcoming of the success secured. Particularly is this the case in connection with the many barren lakes in this province. Beaver lake is a case in point and other outstanding successes are lakes in Strathcona park on the Forbidden plateau near Courtenay, B.C., the elevation of which is about four thousand feet above sea level. There are many lakes in this system, all of which, until 1929, were barren of fish life.

In June, 1929, 90,000 eyed eggs were successfully planted followed in 1930 and 1931 by further shipments of 200,000 Kamloops trout eggs each year, and by 250,000 in 1932. No angling was allowed until the summer of 1932 when the lakes were officially opened to sportsmen by the Attorney General of British

Columbia, the Honourable R. H. Pooley, K.C. Since that time these lakes have become an angler's paradise; sportsmen visiting this district have unanimously and enthusiastically expressed their gratification of the results secured. In the summer of 1933 fish six pounds in weight were captured and specimens of Kamloops trout that had spawned naturally in the spring of 1933 were forwarded to the Pacific Biological Station at Nanaimo, thus showing that these lakes originally stocked by artificial effort have become self supporting. With reasonable protection, they should maintain an abundant supply of trout for the future without fish cultural assistance.

Another case of a somewhat similar nature where outstanding success has followed the introduction of game fish to a previously barren area is Garibaldi lake situated in one of Canada's national parks—Garibaldi Mountain park. This lake is about five thousand feet above sea level and in 1928, 5,000 Kamloops trout eggs from the Pemberton hatchery were planted in Mimulus creek, a tributary of that lake, followed by 12,500 eggs of the same species in 1929. During the summer of 1933 three fish, each weighing in the neighbourhood of nine pounds, were secured by anglers. Some of the fish taken had spawned naturally.

Pavilion lake, near Clinton, B.C., was first stocked in 1919 by the transfer of 2,000 Kamloops trout fry from Paul lake near Kamloops. Further stocking was done in 1924, 1925, 1930, 1932 and 1933; in all, 108,000 eyed eggs were planted in its tributaries in addition to the liberation of the 2,000 fry previously mentioned. Angling conditions have consistently improved and this summer one tourist captured forty-two pounds of Kamloops in one hour, the largest weighing fourteen pounds.

Snowshoe lake, Edgewood, B.C., was barren of fish previous to 1926. That year 20,000 eyed Kamloops trout eggs were planted and it is now heavily stocked. Fish up to twenty-four pounds in weight are being taken.

Jewel lake, near Greenwood, was first stocked with Kamloops trout in 1925 and additional seedlings made each year until 1932, with the exception of 1931. The quantity of seed introduced in those years totalled 110,000 fry and 80,000 eyed eggs. This lake is intensively fished every summer and good catches secured. One fish captured this summer weighed forty-two pounds.

The fishery inspector of Nelson, B.C., reports that fifty barren lakes in his district stocked by the department have in every instance proved successful.

The bodies of water mentioned above in which outstanding success has been definitely proved are a comparatively small percentage of the lakes in this province that have been benefited.

A number of angling associations in the province have, in the last two years, become interested in co-operative fish culture, particularly in the development of rearing ponds, and every effort has been made by the department to assist them, both by advice and practical help.

The Kelowna Rod and Gun Club has developed a series of natural ponds, the water supply for which is obtained from seepage from irrigated lands above, and overflow from other small lakes at a higher elevation. Officers of the department assisted in installing gravel hatching troughs and supplied 140,000 Kamloops trout eyed eggs and fry from Beaver lake camp, Lloyds creek hatchery, Penask and Summerland. Later it was reported that there had been an almost perfect hatch and the fry had passed safely from the gravel to the ponds. Latest information received is that these fish have done exceptionally well and specimens have been submitted six to seven inches in length, and in a particularly well fed condition. No artificial food was given and they subsisted solely on natural food produced in the ponds.

The local angling association at Princeton, B.C., have also achieved splendid success in this line. They constructed a dam and crib with rock and earth fill seventy feet in length, eight feet high and six feet wide, enlarged a small



pond to four and one-half acres and installed another dam across a narrow neck to divide into two ponds. Three thousand Kamloops trout fry from the Summerland hatchery were liberated therein. There is an abundance of natural food including fresh water shrimps in these ponds and the last reports received are that the fish are making splendid progress and, providing these conditions continue, it is hoped to place in the ponds a much greater allotment next season.

The sockeye rearing station at Taft, B.C., was not required by the Biological Board last summer. Therefore the Revelstoke Angling Club was given permission to use it for rearing Kamloops fry. The department transferred from Lloyd's creek station 100,000 Kamloops eyed eggs and the above named organization placed a man in charge and assumed all expenses in connection with the rearing of the resultant fry and their later distribution as fingerlings to Griffin, Victor and Summit lakes.

The Cranbrook Rod and Gun Club have entirely taken over the management of their district fish cultural operations, the department continuing to afford considerable financial assistance by purchasing such eggs as the Club do not require.

Every effort has been made during the past year to conform with the demand for the strictest economy without impairing the success of fish cultural operations in this division but owing to uncontrollable adverse climatic conditions which were responsible for much damage to the property of the department in some districts, heavy expenditure was imperative for replacements and repairs. Unusual expenses were incurred at Lakelse lake hatchery, where freshets destroyed the retaining pond system and the road near the hatchery; also considerable work on Granite creek was necessary to protect the buildings. Other properties that suffered from the same cause were fences and traps at Quap creek, Owikeno lake and fences at Sweltzer creek, Cultus lake. The pipe line at Cowichan lake hatchery also required renewal. The old pipe line had been in operation for over twenty years and was in an irreparable condition. A new fence was also installed on Tl'ell river, Graham island, Queen Charlotte group.

A number of trout fingerlings that were killed in a peculiar manner, not previously known to the department were received from Mr. E. A. Wells who operated a rearing pond on Luckacuck creek near Sardis, B.C. Growing on the sides of the stream is a weed, the Bur-marigold (Stick-tight, *Bidens cernua*), which sheds barbed seeds. When these fall into the water they are snapped at by the small fish and when the barbs come in contact with the skin they take hold and the fish die.

The fish cultural staff of the Western Division have given most conscientious, faithful and unsparing service in the execution of their duties.

## ALBERTA

### BANFF HATCHERY

*J. E. Martin, Superintendent*

The Banff hatchery serves an extensive territory and handles a large number of species of sporting fish. During the calendar year of 1933, a widespread distribution of cutthroat, Loch Leven, rainbow, Eastern brook and salmon trout fry, advanced fry and fingerlings was made in many bodies of water in the province of Alberta. Its operations depend to a large extent on eggs secured by exchange arrangements with the United States Bureau of Fisheries and purchase from commercial firms. The incoming shipments this year consisted of 195,840 salmon trout eggs from Port Arthur hatchery, Ontario, 549,241 rainbow trout eggs and 260,925 speckled trout eggs from Troy, Montana, and



1,311,040 cutthroat trout eggs from Mammoth Hot Springs, Gardiner, Montana. Some 178,800 speckled trout eggs were collected locally at Vermilion lake between October 19 and November 23.

The total distribution of all varieties for the year, including fry resultant from eggs received in the fall of 1932; were: cutthroat trout, 1,207,220; Loch Leven, 440,160; salmon trout, 175,154; speckled trout, 191,430, and rainbow trout, 485,195.

The angling in the district served by this hatchery is generally considered to have been much improved by the fish cultural operations of this station, and many outstanding examples might be quoted that can justly be placed to the credit of artificial assistance given, e.g., Marvel lake, 22·12W5, originally stocked from the substation at Spray lakes, produces many cutthroat trout, some weighing from four to six pounds; Leman lake at the head of the upper Spray river, was stocked from the same source as the one previously mentioned, and fish are reported to be numerous and larger than those mentioned above as secured in Marvel lake; lake O'Hara, 27·17W5, formerly a barren lake, has rainbow trout now well established and specimens are taken up to two and one-half pounds in weight. All of these lakes are about seven thousand feet above sea level. Shadow and Herbert lakes were also barren of fish until stocked with cutthroat trout in 1930. Both have been rigidly protected, and it is reported the former now contains fish up to twelve inches in length and the latter up to seventeen inches. Other lakes that have been benefited by assistance from Banff hatchery are Ross, Taylor, Minnewanka, Two Jacks, Boom, Altrude, Mud and Vermilion; also the following named streams: Bow, Elbow and Highwood rivers and Cataract creek.

The numerous fish and game organizations have been most generous in their co-operation, and their help is greatly appreciated. Pack horses have been gratuitously loaned for the purpose of packing fry to outlying waters, by the wardens and forestry branches. The help of the Director of Fisheries and his outside staff is also gratefully acknowledged.

#### JASPER SUBSIDIARY HATCHERY

Last year Amethyst lake in the Tonquin valley received its first planting with Kamloops trout. This stocking was continued in 1933, the eggs, 92,610 in number, having been secured in June from Lloyds creek hatchery in British Columbia. Speckled trout and rainbow trout eggs were received late in December last year, the former from Rainbow Ranch, Troy, Montana, and the latter through an exchange agreement with the United States Bureau of Fisheries. The following numbers were distributed in 1933: speckled trout, 38,944; rainbow trout, 339,068; Kamloops trout, 83,437.

#### WATERTON LAKES HATCHERY

*G. E. Bailey, Superintendent*

This station, although comparatively recently established, has given splendid service in its district, and all accessible lakes in the Waterton National Park have been stocked with sporting fish with gratifying results. Its operations also depend largely on eggs secured from other than local sources, and in addition to a small local collection of 28,569 rainbow trout eggs from Cameron lake and 1,939 from brood fish retained in Hatchery creek, 375,000 of the same species were received from Troy, Montana, and 614,400 cutthroat trout eggs from Cranbrook, B.C.

Distributions were: cutthroat trout 535,553, and rainbow trout 311,532.

Outstanding examples of improved angling conditions in lakes and streams served from Waterton hatchery are: Alderson, Carthew and Crowsnest lakes, and Old Man river, Crowsnest river and Willow creek.

The results secured by fish cultural assistance from Waterton hatchery in the two first-named bodies of water with cutthroat trout are particularly gratifying. They were both barren lakes prior to 1928, but to-day provide very fine angling during the open season. When the Carthew lakes were opened to angling in 1932 nearly 1,000 trout were taken in the space of one week. In the Crowsnest district very gratifying results were in evidence from the stocking done from the Waterton hatchery, particularly was this the case in connection with Willow creek and Crowsnest river. In the first named, specimens of rainbow trout were secured measuring sixteen inches in length and the angling generally in both bodies of water showed great improvement over past seasons.

#### FRASER RIVER WATERSHED

##### CULTUS LAKE HATCHERY

*A. Robertson, Superintendent*

In the spring of 1933 the distribution of sockeye salmon fry resultant from the 1932 collection was successfully accomplished. A total of 4,568,404 was given a widespread distribution around the shores of Cultus lake. In addition, 807,000 sockeye were distributed from the substation at Smiths Falls resulting from eggs used by the Biological Board in connection with tests to determine the results from the different methods of stripping the parent sockeye salmon.

Last spring an unusually good run of steelhead reached Sweltzer creek and the largest collection to date at this point of eggs of this variety of game fish was secured. It totalled 98,900 eggs. The resultant fry were retained and fed until the end of August when 83,328 well-fed vigorous fingerlings, ranging from one and a third to two and a half inches in length, were liberated in natural ponds tributary to Sweltzer creek. After the losses during incubation were deducted, there still remained 10,000 fingerlings which were transferred to the small retaining tank near the hatchery from which such gratifying results were secured, during the season 1932-33. Rapid growth of the fingerlings in this tank necessitated a further liberation, and in October and November, 1,550 fingerlings, two to three inches in length, were liberated into Sweltzer creek.

Other distributions during the past year were 346 steelhead yearlings ranging from five to seven inches in length, and 3,587 No. 5 fingerlings, five to six inches long in May, making a total distribution of this species of 88,811; cutthroat trout eggs and fry, 169,133; Kamloops trout, 77,975. The eggs of the last-named varieties were received from Cranbrook and Lloyd's creek respectively, and amounted to when received, 170,000 cutthroat and 78,000 Kamloops.

Unfortunately, during October and November, an attack of *Octomitus salmonis* developed amongst the steelhead fingerlings in the small retaining tank, and although a heavy loss was suffered the disease was finally overcome by frequently treating the fish with brine baths.

The run of sockeye to this district last fall was disappointing; 3,425 parent fish were counted into Sweltzer creek as against approximately 4,900 in the brood year of 1929. In addition to the number that reached the hatchery fences, it is reported that approximately 10,000 sockeye bearing the Cultus lake mark of 1929, the brood year, have been identified at the canneries by officers of the Biological Board. Thus, a larger proportionate escapement, equal at least to the escapement of the preceding cycle years, seems to be necessary to maintain the sockeye production of this area.

The collection of sockeye eggs last fall totalled 4,998,900, and of these, 318,200 green eggs were transferred to the Biological Board for the retaining ponds at Smiths Falls.

The program of the board for the current season calls for the planting of eyed eggs in the tributary streams to Cultus lake. Unusually mild climatic



conditions this winter were responsible for the very rapid development of the eggs, consequently well advanced eggs of the earliest collection were available for disposal much earlier than is usually the case at this station and the disposal of these eggs was commenced December 20. On that date, and December 22, 624,438 well-eyed eggs in splendid condition were planted in Spring creek. Before depositing these eggs that part of the stream most suitable for egg planting purposes was cleared of all debris, and the gravel was spaded over and the running water allowed to wash away the silt and mud it contained; also a huge quantity of new gravel was hauled and evenly distributed over that part of the creek bed in which the eggs were planted.

The damage done to the fences on Sweltzer creek in the fall of 1932 was repaired and the fence at the foot of the hatchery pool renewed.

#### PEMBERTON HATCHERY

*T. W. Graham, Superintendent*

Resultant from the collection of 1932, there was available for distribution during the spring of 1933, 21,330,000 sockeye fry. These fry were liberated in the usual way, that is, allowed to leave the incubating troughs when so inclined and pass through a series of small natural ponds to the Birkenhead river.

In June, a shipment of 288,000 Kamloops trout eggs was received from Lloyd's creek station. Of these, 150,000 were delivered to other fishery officers and distributed in lakes Horse, Williams, Burns and Kinney in the northern interior of the province and the remainder, numbering 138,000, were laid down in Pemberton hatchery and later planted as eggs or fry as conditions warranted in the different bodies of water in that district. The total distribution of Kamloops trout was 285,950.

The run of parent sockeye in the fall of 1933 that reached the Birkenhead river was disappointing, it being the smallest for many years and estimated at about twenty-five per cent of the average for the last three seasons; consequently a comparatively small collection of sockeye eggs was secured last season, totalling 10,680,000.

#### PITT LAKE HATCHERY

*R. H. Eaton, Superintendent*

An estimate of the number of parent sockeye that reached the spawning grounds of this district must be of a doubtful nature. Heavy freshets occurred during the collecting period which prevented the capture of the ascending sockeye and consequently, the number of eggs secured was below the hatchery capacity. An additional detrimental factor that will no doubt affect the return of sockeye in the cycle year, is that heavy freshets prevailed after the spawning season which scoured the spawning grounds and very probably destroyed a considerable percentage of the eggs deposited naturally.

The collection totalled 2,310,000 sockeye eggs and was secured from 606 females; some 621 males were used for fertilization. A noticeable difference in proportion of sexes was observed in the fish captured, the males predominating in a ratio of three to two. Conditions were particularly unfavourable for a successful collection as on some days when the greatest number of fish was passing up stream it was impossible to operate the nets, otherwise it is considered that had the conditions been more favourable the hatchery would have secured its full complement.

The total number of sockeye fry and fingerlings resultant from the fall collection of 1932, liberated in the spring of 1933, was 3,201,825. These were widely distributed in many tributaries to the Upper Pitt river.



In June, 20,000 cutthroat trout eggs were received from Cranbrook and after a normal loss of 190 eggs, the remainder 19,810 eyed eggs were planted in a small tributary to Bernice lake. Some 489 coho were also planted from this establishment.

#### VANCOUVER ISLAND

##### ANDERSON LAKE HATCHERY

##### *D. Bothwell, Superintendent*

Distributions of sockeye and spring salmon eggs, fry and fingerlings resultant from the 1932 collections, were successfully accomplished. All local waters were given adequate attention, and in addition, eyed eggs were planted in tributaries to Sproat and Maggie lakes, 2,002,000 and 1,001,000 respectively.

The local distributions in Anderson lake and its tributaries during 1933 were 1,995,414 sockeye fry, advanced fry and fingerlings, and 180,448 spring salmon fingerlings. The total distribution of sockeye was 4,998,414 and of spring salmon 180,448.

The return of parent sockeye this season to the district was disappointing. It is estimated that only 7,500 adult fish reached Anderson lake waters. A heavy run was expected in view of the number that returned in the brood year of 1929 and the particularly favourable spawning conditions of that season, consequently the collection of sockeye eggs, namely, 3,256,000, was much below the number usually secured at this establishment.

In addition to the collection of the above mentioned variety of Pacific coast salmon, 229,500 spring salmon eggs were obtained from Anderson river, this being over double the number that was secured at this point in 1932.

The sub-station on Sproat river was again operated and 464,250 spring salmon eggs were secured, an increase of 27,750 over the number obtained the previous year. Of these, 323,015 were distributed as eyed eggs and 100,000 transferred to Anderson lake hatchery.

Three retaining tanks were in operation during the summer and 25,000 spring salmon fry were placed therein. These fish were transferred from the hatchery troughs to the retaining tanks during the first week in May and retained and fed until September 23 and 25. Unfortunately on May 18 and again the following night, an otter entered one of the tanks and destroyed some 5,000 fingerlings. After deduction of normal loss during retention and the number destroyed by the otter, there was available for distribution 18,619 healthy vigorous fingerlings averaging two and three-quarter inches in length. These were liberated in the Anderson river from which the eggs had originally been secured.

Maggie lake, emptying into Alberni canal, is a small lake approximately three miles in length and half a mile wide, having on the outlet stream a waterfall approximately twenty feet in height; consequently at no time have any Pacific coast salmon been able to reach its spawning grounds. Tidewater reaches to near the foot of the falls. In 1929 slightly over one million sockeye eggs were planted in tributaries of Maggie lake the intention being to later install a fishway if results justified the expense. Returning adult fish were expected last season and district fishery officers were on the lookout for them. Eight sockeye were observed at the foot of the falls on July 11.

Some years ago similar efforts were made to establish a run of sockeye in the waters of Great Central lake and to rehabilitate the Sproat lake area. This was entirely successful and in recent years heavy runs of sockeye have returned to these systems. A somewhat less commercial catch was secured than in 1932, 60,000 sockeye as against 77,000 in the last named year. The escapement to the spawning areas of both lakes was reported to have been all that could be desired. There appears to be no doubt but that the department's fish cultural efforts are responsible for the development of these exceptionally gratifying conditions in connection with the sockeye returns to these two lakes.

## DEPARTMENT OF FISHERIES

## KENNEDY LAKE HATCHERY

*W. P. Forsythe, Superintendent*

In accordance with the practice of recent years, all fry resultant from the 1932 collection were transferred from the hatching troughs to retaining ponds, and fed for greater or lesser periods before release; then, as conditions demanded, they were given a widespread distribution by scow and natural release to beaches and tributaries of Kennedy lake. The total number retained for feeding was 5,357,489, and of that number a loss is recorded during retention of 10,555; thus, 5,346,934 sockeye advanced fry and fingerlings were available for liberation.

In addition to the above, 1,038,795 eyed eggs were planted in Muriel lake and 947,180 in the Upper Kennedy river. Thus the seeding of the district from the collection of 1932 of sockeye eggs, fry and fingerlings totalled 7,332,909.

Fry resultant from the collection of 1932 before transfer to the retaining ponds, were fed for some time on screened herring meal before the total absorption of the food sac, and all such fry showed a marked increase in size and general condition over those of the same age and stage of development not given artificial food but allowed to develop in the natural way and depend for subsistence on nature's provision of their food sac.

The return of parent sockeye to this district, considering all spawning areas, was somewhat disappointing, in view of the heavy seeding and favourable conditions of the brood year of 1929. The total number of parent fish that returned is estimated at approximately 18,000. The early run to Clayoquot river was greater than in any previous year and to the Upper Kennedy river about the same as in the brood year 1929, but the late run did not materialize to the extent expected. The return to all spawning areas of the district in 1929 is estimated to have totalled approximately 23,000 fish; thus, the run of this season shows a decrease of approximately 5,000 sockeye from that of the brood year. A total of 3,368,800 sockeye eggs consisting of 540,000 from early run fish and 2,828,800 from the late run, was obtained as against 7,715,300 the previous season and 7,492,000 in the brood year of 1929.

A factor that to a considerable extent was responsible for the rather disappointing collection was the unequal division of the sexes. The ratio was estimated to be four males to every female; thus it will be appreciated that if an equal division of sexes had returned the collection would have been double that secured.

Although the run generally to the district was less than expected, the number of early run parent fish that reached Clayoquot river was approximately one hundred per cent greater than returned to that stream in the brood year of 1929, from which a collection of 397,000 eggs was secured. The resultant fry were retained and fed in ponds before liberated and this factor may have had considerable bearing on the increase of the number that returned this year, particularly if a comparison is made with the return to the Upper Kennedy river.

The return of parent fish to the last mentioned stream was about equal to that of the brood year when no eggs were taken and natural spawning prevailed. Therefore, it would appear reasonable to suppose that the increased run to the Clayoquot river can be attributed to the artificial assistance given in the brood year of 1929.

## COWICHAN LAKE HATCHERY

*J. H. Castley, Superintendent*

The usual varied fish cultural operations as annually carried on at this establishment were undertaken during the calendar year of 1933. Both local and imported stock of commercial and sporting fish were handled. The dis-



tributions were fry, fingerlings and eyed eggs of spring, coho and Atlantic salmon; steelhead, cutthroat, Kamloops and Loch Leven or brown trout.

Of the above named varieties, Kamloops and some cutthroat trout eggs were imported, namely, 142,000 Kamloops trout eggs from Lloyd's creek eyeing station, of which 112,000 were distributed as eyed eggs and 30,000 laid down in Cowichan lake hatchery and later 28,028 resultant fry released in suitable waters as free swimming fry. Some 270,000 cutthroat eggs were received in June from Cranbrook hatchery.

Three hundred thousand brown or Loch Leven trout eggs were received from Montana in December, 1932, and the resultant fry were transferred to retaining ponds in the close vicinity of this station and to Qualicum Beach. All resultant fingerlings were retained during the summer, and those in the Qualicum ponds were marked and liberated in late September and October in the Little Qualicum river and its tributaries.

At the close of the calendar year there remained approximately 14,000 Loch Leven trout fingerlings in the retaining ponds at Cowichan hatchery which will be retained until the coming spring, then distributed locally.

The local collection of cutthroat trout totalled 73,400 eggs which was over twice the number secured the previous season. In addition to these, 270,000 cutthroat trout eggs, as mentioned above, were purchased from Cranbrook hatchery and a widespread distribution of fry and eyed eggs was made in many bodies of water on Vancouver Island.

The steelhead collection totalled 78,200, being approximately fifty per cent of the number secured in 1932. There was an average run of parent steelhead, but owing to high water in the Cowichan river during the collecting period a much smaller collection was secured than anticipated.

There was a heavy run of coho salmon to this district, a sufficient number of eggs being secured to fill the accommodation available for this variety of salmon. The collection of this species totalled 1,044,000 eggs. Generally these fish were the largest in size ever seen in the Cowichan river, some of them weighing twenty pounds. A collection of 684,000 spring salmon eggs was made in the Cowichan river between October 18 and November 14. The Provincial Game Board secured from Scotland 100,000 Atlantic salmon in January and these were incubated in the Cowichan hatchery.

A new pipe line, two thousand feet in length, was laid down to replace the one originally installed twenty-three years ago.

Distributions were: Atlantic salmon, 20,000; brown trout, 30,589; cutthroat trout, 328,591; Kamloops trout, 140,028; Loch Leven trout, 163,786; spring salmon, 795,257; steelhead salmon, 72,587, and coho salmon, 497,227.

#### SKEENA RIVER WATERSHED

##### BABINE LAKE HATCHERY

*A. P. Hills, Superintendent*

The distribution of sockeye fry and fingerlings resultant from the 1932 collection was successfully accomplished, consisting of 4,877,587 fry, 399,714 No. 1 fingerlings, and 608,449 No. 2 fingerlings, making a total of 5,885,750.

The run of parent sockeye to Morrison creek, on which this hatchery is situated and from which stream the major collections are usually obtained, was below the run of 1930 but larger than the runs of 1931 and 1932. It would appear from the reports of local officers that a sufficient number of sockeye reached Morrison creek to have more than filled the hatchery to capacity, but many that passed through the lower fence before it was closed did not ascend to the traps and yards some distance above but spawned in the creek between the fences where it is practically impossible to net them, particularly during the high-water conditions, such as prevailed during the 1933 season.



An additional factor responsible for the comparatively small collection of sockeye eggs at this station was the failure of parent fish to appear on the spawning grounds at the Babine river at the outlet of Babine lake. In past years when the Morrison creek run has failed, its collection has been augmented at this point. The number of sockeye eggs collected in Morrison creek was 3,552,500 and in Babine river, 114,000, making a total of 3,666,500.

A system of retaining ponds in the close vicinity of the hatchery was operated and a total of 1,008,163 No. 1 and No. 2 fingerlings were liberated therefrom early in August. These fish were in good condition and at the time of liberation averaged one and one-half inches in length. At this stage sockeye fingerlings usually increase rapidly in size, but high temperature of the water supply in late July and early August made it advisable to give the fish their freedom.

#### LAKELSE LAKE HATCHERY

*C. R. T. Hearn, Superintendent*

Owing to disastrous freshets in the fall of 1932, about one-half mile of road in the vicinity of this hatchery was completely destroyed and all fry resultant from the collection of the previous fall had to be carried past this point. A total of 5,452,874 fry were handled in this manner and distributed in suitable parts of Lakelse lake and its tributaries.

The same condition as mentioned above was also responsible for the destruction of about half of the retaining pond system, and no rearing of fry could be undertaken in the remaining ponds owing to their close proximity to the reconstruction work on the road. Again, other abnormal freshets in the fall of 1933 completely obliterated the remainder of the ponds.

The run of sockeye salmon to Lakelse lake last fall was slightly better than that of 1928 and 1931, but appreciably less than the number that reached this district in 1929 and 1930. The collection of sockeye eggs totalled 6,300,200, which is considerably less than the annual average for this station, but is approximately one half million more than secured the previous year.

The eggs laid down last fall were of exceptionally good quality and a very low percentage of loss was confidently expected, but three stoppages of the water supply caused by severe freshets, are responsible for a slightly higher loss than otherwise would have been the case.

A shipment of 40,000 cutthroat trout eggs was received in excellent condition at this station from Cranbrook on June 16, and in view of heavy blasting during construction of the new road in the vicinity of the hatchery, it was considered imprudent to bring these eggs to the hatchery for incubation. A suitable site was located in a small tributary stream to Lakelse lake, where they were hatched out successfully and 38,700 of the resultant fingerlings were liberated in Granite creek the balance being later transferred to a small retaining tank in the hatchery for the purpose of retention and later distribution as yearlings.

Summary of distributions: sockeye salmon, 5,452,874; cutthroat trout, 38,700.

#### MAINLAND WEST COAST

##### RIVERS INLET HATCHERY

*F. A. Tingley, Superintendent*

The sockeye salmon spawning grounds of Owikeno lake area were well seeded by natural reproduction. Heavy runs of this species occurred in the Wauquash, Cheo and Indian rivers. The total sockeye run to the whole area was well up to the average of the last three years. The majority of sockeye that frequent this particular district are generally conceded to be five-year

fish; therefore the returns to the spawning grounds and the increase in the commercial catch over the brood year would indicate that conditions in 1933 were very gratifying and the run to the district is being well maintained. The records show that the pack for the brood year of 1928 was 60,044 cases, and for 1933, 87,360 cases. Even if consideration is given to the possibility that last season's run contained a fair proportion of four-year fish, the commercial pack for 1933 shows an increase of 21,573 cases over and above what was obtained in 1929. In addition to the naturally well seeded spawning areas of the district, the hatchery secured 18,344,900 sockeye eggs. Therefore, it would seem that should no adverse natural condition develop, a heavy return of sockeye salmon should materialize in the cycle year of 1938.

The runs to Quap and Genesi creeks from which the collections for this station are annually secured, were well maintained although only thirty to forty per cent of the seed taken from them each season is returned.

An interesting feature of fish cultural work in this district is the condition that has developed in Walkus lake. This body of water is separated from the main system by a waterfall, approximately one hundred feet in height. The lake was barren of fish life until 1922 when 80,000 sockeye eyed eggs were planted in a small tributary stream. This was the first and only planting. The resultant fish have become landlocked and have degenerated into Kennerly's or Kokanee variety. This was the only seeding undertaken, therefore, theoretically there should be only natural reproduction in each four or five-year cycle. The unusual feature in this connection is that natural reproduction takes place annually. This fall it is reported that there was a heavier run of landlocked sockeye to the spawning grounds of Walkus lake than ever before, although it was observed that they were much smaller than when first seen in 1929.

The run of spring salmon to the Wauquash river was less than half the number that reached this area the previous season, consequently the collection was comparatively small, only 360,135 eggs being secured as against 1,039,240 in 1932, 485,250 in 1931 and 214,500 in 1930.

The distribution of sockeye fingerlings, advanced fry and eyed eggs resultant of the collection of 1932 was successfully accomplished. They were liberated and planted in suitable areas and totalled 16,214,212, consisting of 8,455,557 fry and 7,758,655 eyed eggs. Also, 894,893 spring salmon fry and fingerlings were liberated in the waters of the district.

## SPORT FISH OPERATIONS—SOUTHERN INTERIOR

### NELSON HATCHERY

#### *H. C. Crawford, Superintendent*

The local collections for this station were 351,520 Kamloops trout; 1,250,231 Kennerly's salmon and 280,645 Eastern brook trout eggs. The Kamloops trout eggs were secured during May and June in Cottonwood and Six Mile lakes, the Kennerly's salmon or Kokanee were obtained from Kokanee creek and the Eastern brook trout eggs from Violin lake, near Trail, B.C. In accordance with the present policy to restrict the distribution of the last named variety of sporting fish in the Nelson district and only stock waters in which this species is established, only a limited number of eggs was required, therefore collecting operations were confined to the lake mentioned and no attempt made to secure eggs from Boundary lake from which the major supply has been obtained in recent years. It was considered that the Eastern brook trout eggs from Violin lake were of better quality than those available at Boundary lake, which is of a stagnant nature, the supply of Eastern brook trout eggs obtained therefrom in recent years having been of poor quality.



Some 100,000 cutthroat trout eggs purchased from Cranbrook hatchery were received on July 6.

Distributions for the year were cutthroat trout 98,980; Kennerly's salmon 736,907; Kamloops trout 335,105; Eastern brook or speckled trout 130,512.

LARDO HATCHERY

*H. C. Crawford, Superintendent*

This subsidiary station was erected at Lardo approximately thirty miles from Gerrard hatchery in 1932 and is situated directly on the shore of Kootenay lake at Lardo, B.C.

It was established for the purpose of more economically handling the situation in the upper waters of Kootenay lake as it was considered advisable to annually supply three to five hundred thousand eggs from other collecting camps where they can be secured at a comparatively low cost rather than operate Gerrard hatchery. Thus, this district benefits to a considerable extent, receiving annually a shipment of eggs from other districts and permitting the local fish to deposit their eggs naturally on the spawning grounds of the Lardeau river.

It received 300,000 Kamloops eyed eggs on July 11 from Penask hatchery and made a distribution of 294,200 eggs and fry into Lardeau river and Kootenay lake.

Owing to a break in the Canadian Pacific dam on Davis creek which provided water for the hatchery, it was necessary to hatch the fry in floating baskets in the river. Some difficulty was experienced in this regard as at this time the river was in flood and not confined to its banks along the lower reaches. It also contained much floating debris and silt.

PENASK LAKE HATCHERY

*R. H. Eaton, Superintendent*

Fish cultural operations at this station were not nearly as successful as those of the previous season. A heavy snowfall during the winter and a late, cold spring were responsible for adverse conditions during the egg-collecting period. Freshets occurred when the Kamloops trout were passing up Penask creek, the stream overflowed its banks at the fences, and the majority of the parent fish escaped the traps. Opposite conditions prevailed at the outlet stream, Spahomin creek, over double the number of eggs being secured over any previous season; 555,000 Kamloops eggs were obtained at this point and 457,000 at Penask creek. In 1932, 3,739,000 eggs were secured from the last-mentioned stream and 263,000 from Spahomin creek.

In view of the heavy natural seeding resulting from the escape of the parent fish, it was not considered necessary to return any of the seed secured to Penask lake, therefore, all of the collection was shipped to other parts of the province. Outgoing shipments were:—

Powell lake.....	40,000
Provincial Government station, Stanley Park.....	100,000
Lardo hatching station, Kootenay lake.....	300,000
Beaver lake station, near Kelowna.....	125,000
Summerland hatchery.....	268,209
Charlie lake, Peace river district.....	100,000
Kelowna Rod and Gun Club ponds.....	25,000

By far the greatest distance to which eggs were transferred from this station was Charlie lake. In addition to the number given above, shipped from Penask lake, a like number from Lloyd's creek was added at Kamloops and the whole 200,000 were transferred to Charlie lake. Previous to this distribution this lake



was barren of any game fish; therefore, if the distribution is successful and Kamloops trout become established, a very valuable addition will be made to the natural attractions of this part of the Peace river district.

#### SUMMERLAND HATCHERY

*R. H. Eaton, Superintendent*

This station makes no independent collection of fish eggs but obtains its supply from other establishments and collecting camps, and is utilized for distribution of eggs and fry to many streams and lakes in the Okanagan and Nicola districts. Its major supplies are shipments of Kamloops trout eggs from Penask lake hatchery and Kennerly's salmon from Nelson. This season 268,209 Kamloops trout eggs were received from Penask lake in July and 150,000 Kennerly's salmon eggs from Nelson in December. Some 239,250 Kennerly's salmon fry were liberated into Okanagan lake during February, 1933. Kamloops trout amounting to 266,224 were distributed.

#### LLOYD'S CREEK HATCHERY

*A. P. Hills, Superintendent*

The run of parent Kamloops trout to the spawning grounds of Paul, Pinantan and Knough lakes was appreciably larger than in 1932, consequently a greater number of eggs was secured; the collections from these points totalled 1,318,000, or an increase of nearly 300,000 eggs over the collection of 1932 at these points.

The collection from Fish lake was approximately 100,000 eggs less than secured in 1932, although this does not indicate that there was a lesser number of parent Kamloops. The number of eggs secured in 1933 was 1,167,170 as against 1,274,000 the previous year. The water in Fish lake was about two feet higher than normal and allowance not having been made for this unusual condition, many parent fish leaped the fences. Including the collection secured from the last-mentioned body of water, the total number laid down in Lloyd's creek station was 2,485,170 Kamloops trout eggs, which, after deduction of a normal loss during development, and shipments of 288,000 to Pemberton, 78,000 to Cultus, 142,000 to Cowichan and 92,610 to Jasper, allowed for a distribution of 857,000 eyed Kamloops eggs and 795,600 fry.

In recent years this station, in addition to amply providing an abundant supply of seed for waters from which the collections have been secured, has also shipped annually large quantities of Kamloops trout eggs to many points where successful distributions have been made and many bodies of water have benefitted thereby. This season was no exception to the rule, and nearly one and one-half million eggs were available and distributed far and near as shown under shipments mentioned above.

#### CRANBROOK HATCHERY

Fish cultural operations in this district are entirely under the management of the local angling association, and on the completion of the season of 1932 it was decided by this organization to abandon the original hatchery located on Hospital creek, and erect a more modern and up-to-date establishment on St. Joseph's creek. This building was completed and in readiness for operations in 1933 and the results obtained this year proved entirely satisfactory, justifying the transfer of operations to the new site. The total collection secured from Fish, Munro, Mineral and Reservoir lakes was 2,465,000 cutthroat trout eggs and was a record for this district. In addition, 125,500 Kamloops eggs were obtained from Mineral, Smith and Premier lakes, all of which were originally stocked with this variety by the department.

The department purchased 1,500,000 cutthroat trout eggs from the association and the Provincial Government Game Commission, 400,000. Eggs purchased by the department were 900,000 for distribution in British Columbia and 600,000 for shipment to Waterton hatchery, Alberta. The association allowed generous measurements so that the actual numbers received somewhat exceeded these figures. The remainder, numbering 486,000, were distributed in the district. Some 109,200 Kamloops trout fry and fingerlings were also distributed locally.

Total distributions to all points from this establishment were 2,392,000 cutthroat and 109,200 Kamloops trout.

#### BEAVER LAKE EYEING STATION

*W. L. Goodlet, Officer in Charge*

Beaver lake is situated about twenty-seven miles northeast of Kelowna, B.C., at an altitude of 4,500 feet, and is one of a chain of lakes whose waters eventually discharge into Okanagan lake. These lakes were barren of fish life prior to 1926, when 5,000 Kamloops trout eggs were planted in one of its tributaries. Further introductions of eyed eggs and fry were made in 1927, 1928 and 1931; in all, 7,000 eyed eggs and 13,000 fry were distributed therein. The results were eminently successful and in the last few seasons many fish, ranging from three and one-half to eighteen pounds in weight, have been taken from its waters by anglers.

Last year there were indications that intensive angling was depleting the stock so the department took steps to build up the supply. Equipment was transferred from Summerland hatchery and 128,000 Kamloops trout eggs were secured. In addition, 125,000 eggs of the same species were received from Penask lake. Total distributions amounted to 243,442 Kamloops fry, of which 218,442 were planted in Beaver lake and 25,000 allotted to the Kelowna Rod and Gun Club.

Considerable preparatory work was done installing fences and traps and clearing logs and debris from Crooked creek to facilitate future operations.

#### QUEEN CHARLOTTE ISLANDS

##### TL'ELL RIVER—McCLINTON CREEK

*E. V. Epps, Officer in Charge*

In continuation of the program of the Biological Board at McClinton creek, Queen Charlotte islands, in connection with the habits and life history of the pink salmon that frequent the waters of these islands in huge numbers every second year, and to determine the possibilities for the development of a run of commercial value in the alternative years, similar operations were conducted as in the fall of 1931. The department provided an experienced fish cultural officer to make a collection of pink salmon eggs at the *Tl'ell river* flowing into Hecate straits, one of the few streams, if not the only stream, on Queen Charlotte islands which maintains a run of pink salmon in the off year.

To further facilitate these operations, the department installed a permanent counting fence and new trap on this stream in July which gave greater satisfaction than the temporary structure installed in 1931.

The run of pink salmon was not quite as large as that of the brood year of 1931, but was of sufficient size to allow for the collection between August 26 and September 5 of 695,246 eggs, a sufficient number to meet the requirements of the officers of the Biological Board conducting the investigation.

STATEMENT, BY SPECIES, OF LOCAL COLLECTIONS AND DISPOSALS OF EGGS DURING 1933

Species	Collection area	Number collected	Disposal	Number	Totals
Atlantic salmon.....	South river, Hatchery dam.	32,200	Antigonish hatchery.....	32,200	
	River Philip, N.S.....	4,635,900	Antigonish hatchery.....	1,635,000	
			Middleton hatchery.....	280,500	
			Yarmouth hatchery.....	748,000	
			Miramichi hatchery.....	1,178,400	
			Bedford hatchery.....	791,000	
			Bedford hatchery.....	842,600	
			Margaree hatchery.....	2,092,000	
			Middleton hatchery.....	2,092,000	
			Florenceville hatchery.....	1,045,500	
Speckled trout.....	St. John pond, N.B.....	3,442,640	Florenceville hatchery.....	1,298,824	
			Grand Falls hatchery.....	1,270,260	
			St. John hatchery.....	893,556	
			Biological Board, Toronto.....	1,000	
			Biological Board, St. Andrews.....	49,000	
			Miramichi hatchery.....	1,002,128	
			Restigouche hatchery.....	1,350,131	
			Kelly's Pond hatchery.....	2,720,600	
			Antigonish hatchery.....	4,455	
			Antigonish hatchery.....	7,026,668	17,163,699
Landlocked salmon.....	Lochaber lake, Antigonish county.....	61,625	Antigonish hatchery.....	61,625	
	Margaree hatchery ponds, N.S.....	73,940	Margaree hatchery.....	73,940	
	Yarmouth hatchery ponds, N.S.....	413,000	Yarmouth hatchery.....	413,000	
	Florenceville hatchery ponds, N.B.....	957,266	Florenceville hatchery.....	957,266	
	Fraser's pond,—Three Brooks, Victoria county, N.B.....	393,316	Grand Falls hatchery.....	393,316	
	Black lake, Restigouche county, N.B.....	53,774	Restigouche hatchery.....	53,774	
	St. John hatchery ponds, N.B.....	1,169,146	St. John hatchery.....	1,169,146	
	Kelly's hatchery ponds, P.E.I.....	47,441	Kelly's Pond hatchery.....	47,441	
	Vermilion lake, Alta.....	178,800	Barf hatchery, Alta.....	178,800	
	Violin lake, B.C.....	280,645	Nelson hatchery, B.C.....	280,645	10,660,076
Sockeye salmon.....	Chamcook lakes, N.B.....	279,290	St. John hatchery.....	277,290	
			Biological Board, St. Andrews.....	2,000	279,290
	Boise creek, Pitt River, B.C.....	246,000	Pitt lake hatchery.....	246,000	
	Charles Peter's creek, Pitt river, B.C.....	796,000	Pitt lake hatchery.....	796,000	
	Four Mile creek, Pitt river, B.C.....	161,000	Pitt lake hatchery.....	161,000	
	Mountain slough, Pitt river, B.C.....	1,107,000	Pitt lake hatchery.....	1,107,000	
	Sweetzer creek, Cultus lake, B.C.....	4,998,900	Cultus lake hatchery.....	4,680,700	
			Smiths Falls hatchery (Biological Board).....	318,200	
	Birkenhead river, B.C.....	10,680,000	Pemberton hatchery.....	10,680,000	
	Genesi creek, Owikeno lake, B.C.....	5,266,800	Rivers Inlet hatchery.....	5,266,800	
Landlocked salmon.....	Quap creek, Owikeno lake, B.C.....	13,078,100	Rivers Inlet hatchery.....	13,078,100	
	Granite creek, Lakelse lake, B.C.....	545,400	Lakelse lake hatchery.....	545,400	



## DEPARTMENT OF FISHERIES

## STATEMENT, BY SPECIES, OF LOCAL COLLECTIONS AND DISPOSALS OF EGGS DURING 1933—Concluded

Species	Collection area	Number collected	Disposal	Number	Totals
	Salmon creek, Lakelse lake, B.C.	259, 800	Lakelse lake hatchery.	259, 800	
	Seulabuchan creek, Lakelse lake, B.C.	460, 800	Lakelse lake hatchery.	460, 800	
	Williams creek, Lakelse lake, B.C.	5, 034, 200	Lakelse lake hatchery.	5, 034, 200	
	Babine river, B.C.	114, 000	Babine lake hatchery.	114, 000	
	Morrison creek, Babine lake, B.C.	3, 552, 500	Babine lake hatchery.	3, 552, 500	
	Anderson lake, B.C.	3, 256, 000	Anderson lake hatchery.	3, 256, 000	
	Upper Clayoquot river, Kennedy lake, B.C.	540, 000	Kennedy lake hatchery.	540, 000	
	Clayoquot Arm, Kennedy lake, B.C.	2, 828, 800	Kennedy lake hatchery.	2, 828, 800	52, 925, 300
Cutthroat trout.	Nixon creek, Cowichan lake, B.C.	43, 100	Cowichan lake hatchery.	43, 100	
	Sutton creek, Cowichan lake, B.C.	30, 300	Cowichan lake hatchery.	30, 300	
	Beaver lake, B.C.	128, 000	Beaver lake eyeing station.	128, 000	73, 400
Kamloops trout.	Fish lake, Kamloops, B.C.	1, 167, 170	Lloyds creek hatchery.	1, 167, 170	
	Knough lake, Kamloops, B.C.	219, 000	Lloyds creek hatchery.	219, 000	
	Paul creek, Kamloops, B.C.	843, 000	Lloyds creek hatchery.	843, 000	
	Pimantan creek, Kamloops, B.C.	256, 000	Lloyds creek hatchery.	256, 000	
	Cottonwood lake, Nelson, B.C.	200, 200	Nelson hatchery.	200, 200	
	Six Mile lake, Nelson, B.C.	151, 320	Nelson hatchery.	151, 320	
	Penask lake, Nicola valley, B.C.	457, 000	Penask lake hatchery.	457, 000	3, 976, 690
	Spahomin creek, Nicola valley, B.C.	555, 000	Penask lake hatchery.	555, 000	
Brown trout (albino).	St. John hatchery ponds, N.B.	7, 256	St. John hatchery.	7, 256	
Brown trout (hybrid).	St. John hatchery ponds, N.B.	27, 136	St. John hatchery.	27, 136	7, 256
Loch Leven trout.	St. John hatchery ponds, N.B.	2, 340	St. John hatchery.	2, 340	
Rainbow trout.	St. John hatchery ponds, N.B.	22, 960	Antigonish hatchery.	22, 960	
	Antigonish hatchery ponds, N.S.	3, 000	Yarmouth hatchery.	3, 000	
	Yarmouth hatchery ponds, N.S.	424, 870	St. John hatchery.	424, 870	
	St. John hatchery ponds, N.B.	28, 569	Waterton lakes hatchery.	28, 569	
	Cameron lake, Alta.	1, 939	Waterton lakes hatchery.	1, 939	481, 338
	Spring creek, Alta.	1, 250, 231	Nelson hatchery.	1, 250, 231	1, 250, 231
Kennerly's salmon.	Kokanee creek, B.C.	78, 200	Cowichan lake hatchery.	78, 200	
Steelhead salmon.	Cowichan river, B.C.	98, 900	Cultus lake hatchery.	98, 900	177, 100
	Swelizer creek, Cultus lake, B.C.	1, 044, 000	Cowichan lake hatchery.	1, 044, 000	1, 044, 000
O'oho salmon.	Cowichan river, B.C.	695, 246	McClinton creek hatchery (Biological Board).	695, 246	695, 246
Pink salmon.	Tl'el river, Queen Charlotte Islands, B.C.	229, 500	Anderson lake hatchery.	229, 500	
	Anderson river, B.C.	464, 250	Sproat River Eying Station.	464, 250	
Spring salmon.	Cowichan river, B.C.	684, 000	Cowichan lake hatchery.	684, 000	
	Wauquash river, Owikeno lake, B.C.	360, 135	Rivers Inlet hatchery.	360, 135	1, 757, 885
					90, 500, 987

## Eyed eggs purchased in 1933:—

Cutthroat trout from Cranbrook Rod and Gun Club,—			
Waterton Lakes hatchery.....	614,400		
Cowichan Lake hatchery.....	270,000		
Cultus Lake hatchery.....	170,000		
Lakelse Lake hatchery.....	40,000		
Nelson hatchery.....	100,000		
Pitt Lake hatchery.....	20,000		
Stanley Park hatchery.....	400,000		
			1,614,400
Rainbow trout from Rainbow Ranch, Troy, Montana,—			
Banff hatchery.....	549,241		
Waterton Lakes hatchery.....	375,000		
			924,241
Speckled trout from American Fish Culture Co., Carolina, Rhode Island, U.S.A.—			
Yarmouth hatchery.....	750,000		
Florenceville hatchery.....	250,000		
Grand Falls hatchery.....	1,000,000		
			2,000,000
Speckled trout from Rainbow Ranch, Troy, Montana,—			
Banff hatchery.....	260,925		
			260,925
Speckled trout from Earl Ings, Charlottetown, P.E.I.—			
Kelly's Pond hatchery (received April 5).....	34,000		
Kelly's Pond hatchery (received Nov. 22, Dec. 1 and 9).....	124,200		
			158,200
			4,957,766

## Eyed eggs—no charge:—

Rainbow trout from Cape Cod Trout Co., Wareham, Mass., U.S.A.—			
Yarmouth hatchery.....	200,000		
Salmon trout from Department of Game and Fisheries, Toronto, Port Arthur hatchery,—			
Banff hatchery.....	195,840		
Summary of eggs received—			
Total eggs collected.....	90,500,987		
Total eggs purchased.....	4,957,766		
Total eggs free of charge.....	395,840		
			95,854,593

## Eyed eggs received 1933 from United States Bureau of Fisheries, in exchange for Atlantic salmon:—

Cutthroat trout from Troy, Montana, laid down as follows:—			
Banff hatchery.....	1,311,040		
Loch Leven trout from Bozeman, Montana, laid down as follows:—			
Bedford hatchery.....	302,000		

In the interest of economy and convenience in the distribution of fry the following transfers of eyed eggs were made in 1933:—

Species	From	To	Number	Date received
Atlantic salmon.....	(a) Antigonish.....	Lindloff.....	200,000	March 21
	(a) Miramichi.....	Lindloff.....	500,000	March 23
	(a) Kelly's Pond.....	Margaree.....	800,000	Feb. 24
	(a) Miramichi.....	Restigouche.....	600,000	March 17
	(a) Miramichi.....	Tobique.....	600,000	April 25
Landlocked salmon.....	(a) Restigouche.....	Nipisiguit.....	593,670	April 12
	(a) St. John.....	Bedford.....	75,000	March 16
Speckled trout.....	(a) Antigonish.....	Lindloff.....	100,000	March 21
	(a) Antigonish.....	Yarmouth.....	250,000	March 24
Rainbow trout.....	(a) Grand Falls.....	Florenceville.....	300,000	Feb. 10
	(b) St. John.....	Antigonish.....	75,000	May 19
	(b) St. John.....	Lindloff.....	200,000	May 18
Brown trout.....	(a) St. John.....	Antigonish.....	188,300	March 25
Kamloops trout.....	(b) Penask lake.....	Beaver lake.....	125,000	July 12
	(b) Lloyds creek.....	Cowichan lake.....	142,000	June 29
	(b) Lloyds creek.....	Cultus lake.....	78,000	June 23
	(b) Lloyds creek.....	Jasper Park.....	92,610	June 21
	(b) Penask lake.....	Lardo.....	300,000	July 11
	(b) Lloyds creek.....	Pemberton.....	288,000	June 22
	(b) Penask lake.....	Summerland.....	268,209	July 18
Kennerly's salmon.....	(b) Nelson.....	Summerland.....	150,000	Dec. 19
Spring salmon.....	(a) Sproat river.....	Anderson lake.....	100,000	Jan. 13

(a) 1932 Fall collection. (b) 1933 collection.

## MARKING OF FISH

The marking of Atlantic salmon handled for fish cultural purposes at the several salmon retaining ponds, which was commenced in 1913, was continued in 1933 at Nictaux, Sackville and Margaree ponds. Spring salmon fingerlings were marked at Anderson lake hatchery and speckled trout yearlings and older fish at West river, Nova Scotia. The extent and object of marking is shown in the following statement:—

Marked and Liberated at	Species	Number Marked	Dates of marking	Nature of mark	Object:— To throw some light on
Nictaux river, N.S. ....	Atlantic salmon, adults.....	140	Oct. 30, 31; Nov. 3, 8, 13.....	Silver tag attached to dorsal fin.	The movements of Atlantic salmon in the sea, frequency in spawning and the extent to which early fry of any season return as early fish, or vice versa.
Sackville river, N.S. ....	" "	150	Nov. 6, 10, 13, 14, 15, 19.....	" "	" "
Margaree river, N.S. ....	" "	166	Nov. 14, 15, 21, 28; Dec. 4, 7, 11	" "	" "
Anderson river, B.C. ....	Spring salmon, fingerlings...	18, 619	Sept. 23 and 25.....	Removal of both adipose and dorsal fins.	The percentage of artificially fed fry that return as adults.
West river, Antigonish county, N.S.	Speckled trout, yearlings and older fish.	1, 111	Season of 1933.....	Part of the pectoral fin.....	The movements of trout in West river.



## RE-CAPTURES, 1933—ATLANTIC SALMON

## NICTAUX RIVER, N.S.

Number	Weight (lbs.)	Length (ins.)	Condition	Sex	Date	1. Where liberated 2. Where caught
F2442	7	29	Kelt.....	F	Oct. 30, 1931	Nictaux river, N.S.
	12½	33½	Clean.....	F	May 27, 1933	Nictaux river, N.S.
F2461	6½	28	Kelt.....	F	Oct. 30, 1931	Nictaux river, N.S.
	12½	31½	Clean.....	F	May 29, 1933	Nictaux river, N.S.
F3972	8	30	Kelt.....	F	Nov. 1, 1931	Nictaux river, N.S.
	15½	34	Clean.....	F	May 16, 1933	Nictaux river, N.S.
F4933	6	29	Kelt.....	F	Nov. 16, 1931	Nictaux river, N.S.
	11	32	Clean.....	F	May 29, 1933	Nictaux river, N.S.
F4940	6	29	Kelt.....	F	Nov. 16, 1931	Nictaux river, N.S.
	(u) 9	32½	Kelt.....	F	Nov. 3, 1933	Nictaux river, N.S. (power canal).
F5212	5	28	Kelt.....	F	Nov. 4, 1932	Nictaux river, N.S.
	11	.....	Clean.....	F	Dec. 1933	Portugal Cove, Newfoundland.
F5227	5	28	Kelt.....	F	Nov. 4, 1932	Nictaux river, N.S.
	12	.....	Clean.....	F	Nov. 25, 1933	Amherst Cove, Bonavista Bay, Newfoundland.
F5257	6	29	Kelt.....	F	Nov. 10, 1932	Nictaux river, N.S.
	14	.....	Clean.....	F	Nov. 18, 1933	Lower Amherst Cove, Bonavista Bay, Newfoundland.

## SACKVILLE RIVER, N.S.

F5529	5 lbs.	27½	Kelt.....	F	Nov. 7, 1932	Sackville river, N.S.
	8 ozs.	30	.....	F	1933	Lawn, Newfoundland.
F5549	3	23½	Kelt.....	M	Nov. 8, 1932	Sackville river, N.S.
	6 lbs. 9 ozs.	.....	Clean.....	M	Sept. 28, 1933	Sackville river, N.S.
F5570	11 lbs.	35	Kelt.....	F	Nov. 8, 1932	Sackville river, N.S.
	8 ozs. (u) 13	37	Kelt.....	F	Nov. 9, 1933	Sackville river, N.S.

(u) Liberated with same tag attached.

NOVA SCOTIA  
ANTIGONISH HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Atlantic salmon No. 3 finger- lings	Atlantic salmon year- lings	Brown trout No. 1 finger- lings	Brown trout No. 2 finger- lings	Rainbow trout No. 2 finger- lings	Rainbow trout year- lings
Antigonish Co.—									
Afton river.....		25,000							
Beaver Meadow river.....		50,000							
Black river.....									
Brierly brook, West river.....									
Brierly brook lake.....									
Copper lake.....									
Delhantys lake.....									
Glenroy river.....									
Hatchery pond, South river.....									
James river.....		90,000	10,000						
James river lake.....									
Lochaber lake.....									
McNabs brook-Lochaber lake.....									
Meadow Green river.....									
Mooney lake.....									
North lake.....									
Pinevale lake.....									
Poisons brook-South river.....									
South lake.....		62,000	9,360	2,366					
South river.....									
South river lake.....		100,000							
Tracadie river.....									
West river.....		40,000	10,000						
Wright river.....									
Cumberland Co.—									
Pugwash river.....			160,479		9,188				
River Philip.....			70,000						
Wallace river.....									
Guyborough Co.—									
Chain of lakes.....									
Cole Harbour lake.....									
Copper lake.....									
Country Harbour river.....	80,000								
Cudabays lake.....									
Donohue lake.....									
Doyles lake.....									
East river-St. Marys.....		75,000	90,000						





## ANTIGONISH HATCHERY—Concluded

	Rainbow trout older fish	Speckled trout advanced fry	Speckled trout No. 1 finger-lings	Speckled trout No. 2 finger-lings	Speckled trout No. 3 finger-lings	Speckled trout No. 4 finger-lings	Speckled trout year-lings	Speckled trout older fish
Antigonish Co.—								
Afton river.....			15,000					
Beaver Meadow river.....			5,000					
Black river.....			5,000					
Brierly brook, West river.....			15,000					
Brierly brook lake.....			10,000					
Copper lake.....			15,000					
Delhantys lake.....								
Glenroy river.....								
Hatchery pond, South river.....								
James river.....								
James river lake.....			40,000	55,000	6,500	3,022	152	200
Lochaber lake.....			10,000					300
McNabs brook-Lochaber lake.....			20,000			8,387	39,804	1,333
Meadow Green river.....								
Mooney lake.....								650
North lake.....			15,000				800	
Pinevale lake.....			10,000					
Poisons brook-South river.....			15,000					
South lake.....								
South river.....			25,000			2,687	3,500	422
South river lake.....								
Tracadie river.....			25,000				4,656	611
West river.....								
Wright river.....								
Cumberland Co.—								
Pugwash river.....							2,500	
River Philip.....								
Wallace river.....								
Guysborough Co.—								
Chain of lakes.....								
Cole Harbour lake.....			25,000				2,500	
Copper lake.....					3,000			
Country Harbour river.....								
Cudahays lake.....			15,000					
Donohue lake.....			10,000				2,500	250
Doyles lake.....				10,000				
East river-St. Marys.....								









DEPARTMENT OF FISHERIES

LINDLOFF SUB-HATCHERY

	Atlantic salmon No. 1 finger- lings	Rainbow trout No. 2 finger- lings	Rainbow trout No. 3 finger- lings	Speckled trout No. 2 finger- lings
Cape Breton Co.—				
Black brook (Mira bay).....				5,000
Catalogne lake (Mira bay).....				10,000
Enon lake.....		55,000		
Lever's lake.....		14,000	14,000	
McIsaac's lake.....			26,000	
McMillan's lake.....			26,000	
Pottles lake.....				10,000
Three rivers (Salmon river).....	230,000			
Inverness Co.—				
Big brook (Denny's river).....	60,000			
McDonald's brook (Inhabitants river).....	80,000			
Richmond Co.—				
Black river.....				5,000
Ferguson lake.....				10,000
Framboise river.....	125,000			
Grand lake.....				10,000
Grand river.....	130,000			
Indian lake.....				10,000
Lindloff lake.....			21,040	
McRae lake.....				10,000
Mountain lake.....				5,155
Tillard river (East).....	15,000			
Tillard river (West).....	10,000			
	650,000	69,000	87,040	75,155
Total distribution.....				881,195

## MARGAREE HATCHERY

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings	Speckled trout No. 3 fingerlings	Speckled trout No. 4 fingerlings
Cape Breton Co.—								
Gillis brook-Gillis lake.....								2,000
Jackson lake.....								3,000
Meadow brook-Gillis lake.....								
Dalem lake (Boularderie island) Victoria & Cape Breton Co.								
Inverness Co.—								
North East Margaree river—								
Between Greig's crossing and Hart's pool.....	613, 220			22, 717				
Between hatchery and Greig's crossing.....			50, 000					
Between hatchery and Levis brook.....								
Between hatchery and Rock pool.....								
Big brook.....			40, 000	45, 000				
Big Intervale bridge.....			90, 000	30, 000				
Black Rock pool.....			30, 000					
Boar's Back pool.....				65, 000				
Cranton bridge.....			30, 000	95, 000				
Crowdis pool.....			50, 000	40, 000				
Dunn's brook.....			35, 000	40, 000				
Egypt brook.....					1, 000	2, 000		1, 000
Ethridge pool.....			50, 000					
Gallants brook.....		25, 000		15, 000				
Greig's crossing.....			75, 000					
Hart's pool.....			30, 000	40, 000				
Hatchery brook.....								
Hatchery pool.....	59, 000							
Ingraham's bridge.....			25, 000	40, 000				
Island brooks.....								
Lake O'Law brook.....			65, 000		1, 000			
Levis brook.....			30, 000	25, 000				
Mc Daniels brook.....			30, 000	15, 000				
McDermids crossing.....			50, 000					
McDonalds brook-hatchery brook.....		25, 000						
McLean pool.....				40, 000				
Mull river.....			80, 000					
Old bridge.....			40, 000					
Ross bridge.....				20, 000				
Tingley crossing.....			75, 000					
Timmons brook.....			30, 000					
Wards pool.....				50, 000				
Watsons brook.....					1, 000			
Whittles pool.....				23, 000				



MARGAREE HATCHERY—*Concluded*

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings	Speckled trout No. 3 fingerlings	Speckled trout No. 4 fingerlings
Inverness Co.— <i>Contc.</i>								
Graham brook-Whycocomagh.....								1,000
Indian river-Whycocomagh.....								1,720
Little River Cheticamp.....			120,000					500
River Inhabitants.....								
South West Margaree river— McDonnell brook.....			40,000					
Victoria Co.—								
Baddeck river—								
Crowdis bridge.....			15,000					
East branch, headwaters.....			80,000					
Forks.....			70,000					
Gillis bridge.....			25,000					
North branch.....			40,000					
Barachois river.....							4,000	
Clyburn brook-Ingomish bay.....								
Middle river—								
Beaver brook.....			40,000					
Church bridge.....			35,000					
Foot bridge.....			50,000					
Headwaters.....			40,000					
Indian brook.....			40,000					
McLennans brook.....			40,000					
North river.....			40,000					
St. Ann's river—								
Church brook.....					1,000			
Goose Cove brook.....					1,000			
South Gut brook.....					1,000		8,000	
Warren lake.....								
	672,220	50,000	1,580,000	660,717	6,000	2,000	16,000	11,220

Total distribution..... 2,998,157

## MIDDLETON HATCHERY

	Atlantic salmon No. 2 fingerlings	Atlantic salmon No. 3 fingerlings	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings	Speckled trout No. 3 fingerlings	Speckled trout No. 4 fingerlings	Speckled trout yearlings
Annapolis Co.—							
Allen lake (west).....				10,000			
Annapolis river.....		70,000					
Morton brook.....			2,000				
Paradise brook.....				10,000			
Parker brook.....				5,000			
Slocomb brook.....			3,000				
Bear lake.....				5,000			
Birch Bark lake.....					10,000		
Chute lake.....				10,000			
Elliott lake.....				10,000		400	19
Gibson lake.....				10,000			
Hatchery pond.....						1,475	
Keyhole lake.....				5,000			
Kelly brook — Curl Hole lake.....				5,000			
Lake Joli.....				10,000			
Lake LeMerchant.....				10,000			
Lake Pleasant.....			10,000				
Lequille river.....		20,000					
Lequille river—headwaters				5,000			
Lily lake.....				5,000		300	19
Little river.....				15,000			
Long lake.....				10,000			
Millford lakes.....				15,000			
Nictaux river.....	100,000	193,400					
Quilty lake.....			10,000				
Round Hill river.....		30,000					
Round Hill river—head- waters.....				5,000			
Scragg lake.....					10,000		
Shannon river.....			10,000			375	
Spectacle lake.....				10,000			
Springfield lake.....			10,000				
Taller lake.....				10,000			
Thirty lake.....			10,000				
Trout lake.....			20,000				
Waterloo lake.....				10,000			
Zwicker lake.....			10,000				
Digby Co.—							
Haines lake.....				10,000			
Malletts lake.....				10,000			
Hants Co.—							
Armstrong river.....				10,000			
Avon river—							
LeBreau brook.....				5,000		200	
South branch.....		15,000					
West branch.....	15,000						
Cameron lake.....				10,000		300	
Canoe lake.....					10,000		
Cards lake.....			15,000				
Coxcomb lake.....				10,000			
Five Mile lake.....					5,000		
Kennetcook river.....		20,000					
Meander river.....		20,000					
Murphy lake.....			10,000				
Nixes lake.....				10,000			
Panuke lake.....				20,000			
River Herbert.....		15,000					
River Herbert — head- waters.....					10,000		
Walton river.....				10,000			
Zwicker lake.....			10,000				
Kings Co.—							
Cornwallis river—							
Adams brook.....			5,000				
Bowlby brook.....			5,000				
Lawrence brook.....			5,000				
Gaspereau river.....	25,000						
Grand Pre Memorial Park- ponds.....				400			25
Habitant river.....			10,000				
Lake Torment.....			10,000				

## DEPARTMENT OF FISHERIES

MIDDLETON HATCHERY—*Concluded*

	Atlantic salmon No. 2 fingerlings	Atlantic salmon No. 3 fingerlings	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings	Speckled trout No. 3 fingerlings	Speckled trout No. 4 fingerlings	Speckled trout yearlings
Lunenburg Co.—							
Butler lake.....				10,000			
Gold river.....		70,000		15,000			
Hardwood lake.....					10,000		
Horse lake.....							
La Have river.....		60,000		15,000			
Mud brook.....							
North branch.....		25,000					
Lake Sherbrooke.....					10,000		
Lewis lake.....				10,000			
Little Winnifred lake.....				10,000			
Medway river.....		90,000					
Petite riviere.....		30,000					
Smith lake.....					10,000		
Upper Sixty lake.....				10,000			
Whelan lake.....				10,000			
Whitstone lake.....					10,000		
Whitney lake.....				10,000			
	140,000	658,400	155,000	360,400	85,000	3,050	63

Total distribution..... 1,401,913

## NICTAUX FALLS REARING POND

	Atlantic salmon No. 2 fingerlings	Atlantic salmon No. 3 fingerlings
Annapolis Co.—		
Nictaux river.....	28,000	16,500
	28,000	16,500

Total distribution..... 44,500



## YARMOUTH HATCHERY

[illegible]

YARMOUTH HATCHERY—Concluded

	Atlantic salmon fry	Atlantic salmon No. 1 finger-lings	Atlantic salmon No. 2 finger-lings	Atlantic salmon No. 3 finger-lings	Atlantic salmon No. 4 finger-lings	Atlantic salmon year-lings	Kamloops trout 2 year olds	Rain-bow trout No. 2 finger-lings	Rain-bow trout No. 3 finger-lings	Rain-bow trout No. 4 finger-lings	Rain-bow trout No. 5 finger-lings	Rain-bow trout finger-lings	Speckled trout fry	Speckled trout No. 1 finger-lings	Speckled trout No. 2 finger-lings	Speckled trout No. 5 finger-lings	Speckled trout year-lings
Yarmouth Co.—																	2,500
Argyle river.....								10,000				5,500					3,000
Bird lake.....																	10,000
Cedar lake.....															25,000		5,000
Coldstream river.....																	
Lake Annis.....																	
Lake Ellenwood.....							1,000										
Lake Utley.....								10,000							15,000		
Little Brazil lake.....																	
Moulton lake.....				15,000									12,000				500
Salmon river.....																	4,000
Gardners brook.....																	
Scotia brook-Forchu river.....																	
Sunday lake.....																	
Tusket river.....	100,000														20,000		4,000
East branch.....															10,000		11,500
West branch-Reynards bridge.....																	
Two island lake.....																	
Whistler lake.....																	
	75,000	160,000	220,000	220,000	10,000	11,000	1,000	65,000	15,000	14,000	3,000	23,500	12,000	161,585	228,000	10,000	93,000

Total distribution..... 1,322,085

NEW BRUNSWICK  
FLORENCEVILLE HATCHERY

	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 3 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 3 fingerlings	Speckled trout older fish
Carleton Co.—						
Acker creek-St. John river.....				20,000		
Becaguimec river.....	195,000	17,000				
Big Guisguir river.....				47,000	1,800	48
Big Presquile river.....	130,000					
Bogan brook-South West Miramichi river.....	10,000					
Bubby's brook-St. John river.....				7,000		
Bulls creek-St. John river.....				51,000		
Buttermilk creek-St. John river.....					350	
Centreville pond-Presquile river.....						156
Clearwater brook-South West Mira- michi river.....	10,000					
Dingee brook-St. John river.....				3,000		
Elliott brook-South West Miramichi river.....	35,000					
Gallivan brook-St. John river.....			6,000			
Gibson creek-St. John river.....				20,000		
Glassville pond-Shiktahawk river.....				5,000		
Hagerman brook-St. John river.....				20,000		
Hardwood brook-St. John river.....				12,000	1,800	
Hathaway brook-St. John river.....					750	
Lanes creek-St. John river.....			8,000			
Little Guisguir river.....				36,000	1,800	
Little Presquile river.....	50,000	13,283		10,000		
Little Shiktahawk river.....	50,000					
Lockharts pond-Shiktahawk river.....						56
Mallory brook-St. John river.....				15,000		
Marven brook-Meduxnekeag river.....	10,000					
Maynes brook-Presquile river.....				15,000		
McLeary's brook-Lakeville pond.....			15,000			
McQuade pond-St. John river.....				40,000		
Meduxnekeag river.....	155,000	17,000				
Mile brook-St. John river.....				3,000	600	
Monquart river.....	130,000	17,000				
Payson lake.....				10,000		
Priests brook-Shiktahawk river.....				10,000		
River de Chute.....				50,000	2,000	98
Shiktahawk river.....	130,000	17,000				
Simpson brook-South West Miramichi river.....	10,000					
Smith brook-Becaguimec river.....				5,249		
South West Miramichi river-north branch.....	150,000					
South West Miramichi river-south branch.....	150,000					
Stickney brook-St. John river.....				5,000		
Teague brook-South West Miramichi river.....	15,000					
Tweedie brook-St. John river.....				6,500		
White Marsh creek-St. John river.....				8,188	1,800	129
Charlotte Co.—						
Digdeguash river.....				60,000		
York Co.—						
Davidson lake.....				35,000		
Dunbar brook-Nashwaak river.....				15,000		
First Eel river lake.....				25,000		
Second Eel river lake.....				25,000		
Indian lake.....				25,000		
Keswick river.....	90,000					
Mactaquac river.....	50,000					
McBean brook-Nashwaak river.....				15,000		
Nackawic river.....	50,000					
Nashwaak river.....	100,000	28,000				
Nashwaaksis river.....			75,000			
Nigger brook-Nackawic river.....				12,000		
Pokiok river.....				50,000		
Risteen lake.....				25,000		
Shogomoc river.....			45,000			
Skiff lake.....	50,000	17,000				



## DEPARTMENT OF FISHERIES

FLORENCEVILLE HATCHERY—*Concluded*

	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 3 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 3 fingerlings	Speckled trout older fish
York Co.— <i>Con.</i>						
Taffa lake.....				15,000		
Tay stream-Nackawic river.....				15,000		
Zeland lake.....				5,000		
	1,570,000	126,283	149,000	720,937	10,900	487

Total distribution..... 2,577,607

## GRAND FALLS HATCHERY

	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings	Speckled trout No. 1 fingerlings
Salmon river—Victoria Co.—			
Salmon river, mouth of.....	45,000	55,000	20,000
Salmon river, outlet.....			15,000
East branch.....			15,000
North branch.....			
Aubin crossing.....	45,000		
Big bogan.....	45,000	10,000	
Big brook.....			15,000
Boat landing.....	45,000	10,000	
Cyr flats settlement.....	45,000		
Davis Mill brook.....	25,000		
Foley brook.....	50,000	35,000	
Four Falls brook.....			20,000
Graham brook.....			20,000
Head waters, Salmon river.....	20,000	35,422	
Iron bridge.....	15,000		
Little Salmon river.....	45,000		
Main Salmon river, Davis mill to mouth of Salmon river.....	50,000		
Mooney brook.....	25,000		
Morin bogan.....	35,000		
Otter Slide.....			7,000
Ryan brook.....			15,000
Small lake-Salmon river.....			4,000
Sutherland brook.....			50,000
Tom Cote Mill brook.....	45,000		
St. John river—Victoria Co.—			
At hatchery.....		1,000	
Andover bar.....	45,000	15,000	
Argosy crossing.....	80,000	25,000	
Aroostook bar.....	45,000		
Aroostook junction.....	45,000	25,000	
Black rapids.....	5,000		8,000
Boutout brook.....			
Costigan point.....	45,000		
Dee point.....	45,000		
Gillespie lake.....			15,000
Hatchery brook or Rapide de Femme.....	5,000		24,419
Indian Ferry.....	20,000		
Inman flats.....	100,000		
Kilburn ferry.....	50,000		
Limestone siding.....	95,000	60,000	
Little river-Grand Falls.....			75,000
Lower basin.....	10,000		
Lower Perth.....	50,000	10,000	
Morell siding.....	70,000	55,000	
Muniac river, mouth of.....	140,000		
Muniac brook.....		15,000	
Ortonville siding.....	45,000	60,000	
Madaswaska Co.—			
Baker lake.....			135,000
Caron lake.....			10,000
Grand river—			
Bear brook.....			60,000
Green river.....			200,000

GRAND FALLS HATCHERY—*Concluded*

	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings	Speckled trout No. 1 fingerlings
St. John river— <i>Con.</i>			
Madawaska Co.— <i>Con.</i>			
Little river.....			40,000
Beaver brook.....			5,000
Dead brook.....			30,000
Head waters.....			45,000
Perkins brook.....			10,000
Rocky brook.....			5,000
Mazeroll pond.....			2,000
Seigas river.....			10,000
Unique lake.....			50,000
	1,430,000	411,422	905,419

Total distribution..... 2,746,841

## MIRAMICHI HATCHERY

	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings	Atlantic salmon No. 3 fingerlings	Speckled trout No. 1 fingerlings	Speckled trout No. 3 fingerlings
Aboujagan river.....				7,000	
Bartibogue river.....	75,000	27,200	14,400		
Bass river.....		30,000			
Bay du Vin river.....	97,500	12,800			
Black river.....	135,000	12,000			
Buckley lake.....				5,000	
Buctouche river.....	30,000				
Burnt church river.....	82,500				
Caraquet river.....				6,600	
Cocagne river.....	30,000				
Eagle lake.....				5,000	
Estey lake.....				4,000	507
Grand Aldouane river.....					6,400
Hashmans brook—Westmoreland Co.....				7,000	
Kouchibouguac river.....	30,000				
Little South West Miramichi river.....	630,000	98,400			
Little river—Nipisiguit bay.....		22,500			
Nappan river.....	52,500				
North West Miramichi river.....	1,080,000	110,400			
Millstream.....	82,500	12,800			
Sevogle river.....		147,200			
Stewart brook.....	28,000				
Trout brook.....	24,000				
Pokemouche river.....				12,500	
Richibueto river.....	30,000				
Shaddock lake.....				8,000	
South West Miramichi river—					
Barnaby river.....	105,000	27,200			
Bartholomew river.....	52,500				
Burntland brook.....				10,000	
Cains river.....	106,500	79,700	26,400		
Porter brook.....				10,000	
Renous river.....	180,000	68,400			
Dungarvon river.....	52,500	44,400			
Taxis river.....	97,500				
Tabusintac river.....	82,500		14,400		
Eskeddelloc brook.....				8,000	
Tetagouche river.....		22,500			
Tracadie river.....				12,500	
Little Tracadie river.....				6,600	
Votoure lake.....				5,000	
	3,083,500	715,500	55,200	107,200	6,907

Total distribution..... 3,963,307

## DEPARTMENT OF FISHERIES

## NIPISIGUIT SUB-HATCHERY

	Atlantic salmon fry
Nipisiguit river—	
Bear island, foot of.....	30,000
Bear island, head of.....	30,000
Church point.....	33,000
Club House pool.....	33,000
Comeau landing.....	31,000
Gilmore brook.....	30,000
Grilse pool.....	30,719
Knight brook.....	30,000
Long Meadow, head of.....	30,000
Marchall Boudreau beach.....	30,000
Middle beach.....	30,000
	337,719
Total distribution.....	337,719

## RESTIGOUCHE HATCHERY

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings	Speckled trout advanced fry
Black river.....					2,000
Jacquet river.....		40,000			
Middle river (Gloucester Co.).....	40,000				
Restigouche river.....	250,000	192,000	5,300	46,000	
Christopher brook.....					25,430
At Dawsonville.....	40,000				
Little river, P.Q.....					35,000
Matapedia river.....	365,000	285,000		45,000	
Millstream falls.....	50,000				
Pitts siding.....	50,000				
Upsalquitch river.....	350,000	75,000		44,356	
Grog brook.....					35,000
Walker brook.....					15,000
Wires brook.....	50,000				
	1,195,000	592,000	5,300	135,356	112,430
Total distribution.....					2,040,086



SAINT JOHN HATCHERY

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic No. 1 finger-lings	Atlantic salmon No. 2 finger-lings	Atlantic salmon No. 3 finger-lings	Brown trout advanced fry	Brown trout No. 1 finger-lings	Brown trout old fish	Brown trout albino No. 1 finger-lings	Brown trout albedo 3 year olds	Brown trout hybrid No. 1 finger-lings	Land-locked salmon advanced fry
Albert Co.— Jonah pond-Petitcodiac river. Turle Creek-Petitcodiac river Atlantic Biological Station, St. Andrews, N.B. Chandler's Cove Bartlett lake-thoroughfare brook. Bonaparte lake. Bonaparte lake-rearing pond. Burnt dam lake. Clamcook lake. Clarence stream—Magaguadavic river. Clear lake. Craig brook-Digdegash river. Dead water brook-Magaguadavic river. Disappointment lake. Gibson lake. Green Brown brook-Canous river. Halls brook-Digdegash river. Hitching brook-Digdegash river. Keer lake. Lake Utopia. Limeburner lake-rearing pond. Little lake-Poologan river. McDougall lake. McDowell pond. Murelle brook-St. Croix river. Piskatagan river. Poologan river. Red Rock lake. Soap brook-St. Croix river. St. Croix rearing pond. Stein lake. St. Patrick lake.	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic No. 1 finger-lings	Atlantic salmon No. 2 finger-lings	Atlantic salmon No. 3 finger-lings	Brown trout advanced fry	Brown trout No. 1 finger-lings	Brown trout old fish	Brown trout albino No. 1 finger-lings	Brown trout albedo 3 year olds	Brown trout hybrid No. 1 finger-lings	Land-locked salmon advanced fry
King's Co. Danks lake. Dolan lake. Kennebecasis river. Kennebecasis river-headwaters. Maine lake. McBrann lake. Moss Glen lake. Parlee brook-Kennebecasis river. Piquet stream-Kennebecasis river. Pollett lake.	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic No. 1 finger-lings	Atlantic salmon No. 2 finger-lings	Atlantic salmon No. 3 finger-lings	Brown trout advanced fry	Brown trout No. 1 finger-lings	Brown trout old fish	Brown trout albino No. 1 finger-lings	Brown trout albedo 3 year olds	Brown trout hybrid No. 1 finger-lings	Land-locked salmon advanced fry



[illegible]



SAINT JOHN HATCHERY—*Continued*

Land-locked salmon finger-lings	Land-locked salmon No. 2 finger-lings	Land-locked hybrid 2 year olds	Loch Leven trout finger-lings	Rain-bow trout finger-lings	Rain-bow trout No. 1 finger-lings	Speck-led trout green eggs	Speck-led trout advanced fry	Speck-led trout finger-lings	Speck-led trout No. 1 finger-lings	Speck-led trout finger-lings	Speck-led trout No. 3 finger-lings	Speck-led trout finger-lings	Speck-led trout No. 4 finger-lings	Speck-led trout year-lings and older
Albert Co.—														
Jonah pond-Petitcodiac river.....														
Turtie creek-Petitcodiac river.....														
Atlantic Biological Station, St. Andrews, N.B.														
Charlotte Co.	2,000					60,000			10,000	5,000				
Bartlett lake-thoroughfare brook.....														
Bonsaparte lake.....									5,000					
Bonsaparte lake-rearing pond.....									10,000	1,000				
Burnt dam lake.....														
Chancock lake.....		155							10,000					
Clarence stream-Magaguadavic river.....														
Cleat lake.....														
Craig brook-Digdegush river.....									10,000					
Dead water brook-Magaguadavic river.....									10,000					
Disappointment lake.....									10,000					
Gibson lake.....									15,000					
Gibson lake-rearing pond-Upper Magaguadavic lake.....	14,470								5,000					
Halls brook-Digdegush river.....									15,000					
Hitting brook-Digdegush river.....									10,000					
Kerr lake.....									40,000					
Lake Utiagash.....											1,000			
Little upper lake-rearing pond.....														
Little lake-Pocologan river.....														
McDougall lake.....									5,000					
McDougall pond.....									15,000					
Murchie brook-St. Croix river.....										4,500				
Piskahagan river.....									5,000					
Pocologan river.....														
Red Rock lake.....									10,000					
Soap brook-St. Croix river.....										500				
St. Croix rearing pond.....									10,000					
Stein lake.....									10,000					
St. Patrick lake.....												2,500		
Kings Co.—														
Clarks lake.....							5,000							
Dolan lake.....														
Kennebecasis river.....									20,000					
Kennebecasis river-head waters.....									5,000					
Marys lake.....														
Melbrien lake.....														
Mess Glen lake.....														
Parlee brook-Kennebecasis river.....									5,000					
Piquett stream-Kennebecasis river.....									10,000					
Pollett lake.....									10,000					
Salmon river.....									5,000					
Smith creek-Kennebecasis river.....									5,000					
Therriault lake.....														
Trout creek-Kennebecasis river.....									5,000					

[illegible]

Total distribution.

1,665,893

(x) Operated by St. John branch of the New Brunswick Fish and Game Protective Association in conjunction with the Loch Lomond Protective Association.

TOBIQUE SUB-HATCHERY

	Atlantic salmon fry
Tobique river—	
Tobique forks.....	50,000
Blue bogan.....	10,000
Blue Mountain bend.....	15,000
Davis bogan.....	10,000
Dow flats.....	15,000
Everett bogan.....	10,000
Fraser lodge.....	15,000
Gaunces bogan.....	10,000
Grear flats.....	25,000
Haley brook.....	50,000
Hatchery brook.....	10,000
Hatheway bogan.....	15,000
Horse island bogan.....	21,172
McCarthy flats.....	25,000
Millers bogan.....	35,000
Plaster rock.....	25,000
Riley brook.....	25,000
Rocky brook.....	15,000
Tapley flats.....	40,000
Two Brooks.....	50,000
	471,172
Total distribution.....	471,172

PRINCE EDWARD ISLAND

KELLY'S POND HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 3 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings	Speckled trout No. 3 fingerlings
Kings Co.—							
Bear river.....				4,000			
Big pond.....				5,000			
Bristol pond (Hoopers pond).....				4,000			
Cardigan river.....	24,000						
Cardigan river, head of.....				5,000			
Coogan's stream-Morell river.....	53,300	18,000	3,000				
Crane's pond, below mill-Morell river.....		32,000					
Dingwell pond-Fortune river.....		12,300					
East lake.....					5,000		
Fisher's brook-Morell river.....				5,000			
Fortune river.....	35,000						
Goose river.....				6,000			
Grant's bridge-Morell river.....		30,000					
Hay river.....				5,000			
Leard's pond, below mill-Morell river.....	35,000						
Leard's bridge-Morell river.....			3,154				
Martin Vale stream (Cranes pond)-Morell river.....				6,000			
McAulay's brook-Morell river.....				5,000			
McKinnon's stream-Morell river.....	53,300						
McLeod's pond-Murray river.....					6,000		
McRae's pond-Montague river.....					6,000		
Midgell river.....		50,000					
Mill stream-Rollo bay.....		30,000					
Montague pond.....							
Montague pond (New pond).....				6,000			
Mooney's bridge-Morell river.....	30,400	12,300		6,000			
Mooney's stream-Morell river.....	35,600						
Mooney's pond-Morell river.....				3,000			
Naufrage river.....	35,000	30,000					
North lake.....				5,000			
Priest pond.....				5,000			
Quigley's pond.....				5,000			
Quigley's pond, below mill dam.....	32,000						
Red bridge-Morell river.....		32,000					
Schooner pond.....	25,000						
Souris river.....					5,000		
Sturgeon river.....		32,000					
Warren's pond.....				3,000			
West river.....					4,000		
Prince Co.—							
Bain's brook.....					4,500		
Beaton's brook-Percival river.....				5,000			
Big Pierre Jacquet river.....				6,000			
Little Pierre Jacquet river.....				6,000			
Black pond.....	25,000						
Bray river.....				5,000			



## KELLY'S POND HATCHERY—Concluded

	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 3 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings	Speckled trout No. 3 fingerlings
<i>Prince Co.—Concluded</i>							
Conroy's pond.....					5,000		
Crosman's pond.....					4,000		
Doyle's brook.....					4,000		
Dunk river.....	32,000	64,000					
Gordon's pond-Kildare river.....				6,000			
Green's stream (Miminegash).....	35,600						
Marchbank's pond-Kildare river.....				6,000			
Myer's pond.....					4,000		
Nail pond.....	17,800						
Pridham's pond-Kildare river.....				6,000			
Reid's brook-Miminegash river.....	26,000						
Rix stream.....					4,000		
Round pond.....				8,000	200		
Sea Cow pond.....					4,500		
Skinner pond.....	17,800						
Tignish river.....					4,500		
Webster's pond-Dunk river.....					3,000		
Wright's pond, 100 miles from hatchery.....					4,000		
Wright's pond-Dunk river, 46 miles from hatchery.....					5,000		
<i>Queen's Co.—</i>							
Adam's pond.....				3,000			
Andrew's pond.....					3,000		
Bagnall's pond-Hunter river.....				4,000			
Beer's pond-Clyde river.....				3,000			
Birt's brook-Covehead.....					2,500		
Black river.....				4,000			
Blooming point pond.....				10,000			
Brander's pond.....				3,000			
Callaghan's pond-East river.....					5,000		
Campbell's pond.....				3,000			
Clark's stream-East river.....				6,000	8,000		
Cousin's pond.....					5,000		
Crapaud mills.....				3,000			
Craswell's pond-Clyde river.....				4,000			
Crooked creek.....					5,000		
Dixon's pond.....					5,000		
Found's pond.....							
Gurney's stream.....		30,000		5,000			
Hardy's pond.....							
Hatchery brook.....						11	
Henry's pond.....						4,500	
Hillsboro or East river, head.....	35,000						
Holme's pond.....					3,000		
Hope river.....				4,000			
Johnson's river.....		30,000					
Lake Verde.....					6,000		
McCallam's pond.....					3,000		
Miller's creek-East river.....				3,000			
North river.....		32,000					
Parson's pond.....				5,000			
Pleasant Grove-Winter river.....					5,000		
Rackham's pond.....				5,500			
Scott's pond-Clyde river.....				5,000			
Simpson's pond.....							3,560
Stephenson's pond.....				3,000			
Vessey's brook-Winter river.....				9,000			
Winter river.....	35,600	64,400					
Wisner pond-McKennis brook.....					6,000	1,872	
Wood pond-Hunter river.....				4,000			
	583,400	499,000	6,154	212,500	129,200	6,383	3,560

Total distribution..... 1,440,197



[illegible]







## DEPARTMENT OF FISHERIES

## JASPER PARK HATCHERY

	Kamloops trout fry	Rainbow trout fry	Speckled trout fry
Amethyst lake, Tonquin valley.....	83,437		
Athabaska river-(beaver dams) Maligne range.....		15,000	
Caledonia lake.....		7,000	
Celestine lake.....		6,000	
Deacon lake.....		10,000	
Devona lake.....		10,000	
Edson river north fork.....		10,000	
Erith river—			
Center creek, near Lovett.....		5,000	
Crooked creek, near Lovett.....		2,500	
Halpenny, near Sterco.....		2,500	
Lovett creek, near Lovett.....		10,000	
Embarras river—			
Bryon creek, near Robb.....		5,000	
Chance creek, near Coalspur.....		5,000	
Dummy creek, near Coalspur.....		5,000	
Mitchell creek, near Robb.....		5,000	
Thirty-one mile creek, near Robb.....		5,000	
Thirty-five mile creek, near Robb.....		5,000	
Evelyn lake.....		15,000	
Hibernia lake.....		15,000	
Honeymoon lake.....		30,000	
Lake Annette.....		10,000	12,000
Lake Edith.....		10,000	12,000
Leach lake.....		15,000	
Leyland creek (beaver dam) near Leyland.....		5,000	
Marjorie lake.....		15,000	
Mary Gregg lake, near Lucas.....		5,000	
Cabin creek.....		5,000	
McLeod river—			
Hornback river.....		10,000	
Sundance creek.....		10,000	
Horse creek.....		5,000	
Trout creek, near Peers.....		10,000	
Five Mile Prairie.....		5,000	
Spreen creek.....		5,000	
Watson creek, near Leyland.....		5,000	
Minnow lake T. 45, R. 2, W. 6.....		7,000	
Pembina river, near Lovett.....		2,500	
Pocahontas (beaver dams).....		9,000	
Pyramid lake, creek west.....		5,068	
Rainbow lake, near Lovett.....		2,500	
Rocky river, upper.....		20,000	
Trefoil lake.....			14,944
Unnamed creek, Wolf river.....		5,000	
Zanzell lake, near Marlboro.....		5,000	
	83,437	339,068	38,944

Total distribution..... 461,449



## WATERTON LAKES HATCHERY

	Cutthroat trout advanced fry	Cutthroat trout No. 1 fingerlings	Cutthroat trout yearlings	Cutthroat trout 2 year olds	Rainbow trout advanced fry	Rainbow trout No. 1 fingerlings	Rainbow trout No. 2 fingerlings	Rainbow trout yearlings
Alderson lake (17-1-30 W. 4).....	5,000							
Belly river.....	30,000				1,000			
Cardston, Alta.—Purchased by J. C. Shaw, Esq.....								
Castle river—								
Beaver Mines creek.....						10,000		
Gardener creek.....						8,500		
Gladstone creek.....						10,000		
Lynx creek.....						8,500		
Mill creek.....	30,000					20,000		
Crowsnest lake.....								
Crowsnest river—								
Allison creek.....						10,000		
Blairmore creek.....						10,000		
Byron creek.....						10,000		
Gold creek.....						10,000		
Star creek.....						5,000		
Todd creek.....	25,000					25,000		
Livingstone river (6-11-3 W. 5).....								
Old Man river—								
Adair creek.....	5,000							
Beaver creek.....	30,000							
Beaver dams (8-11-3 W. 5).....	40,000							
Beaver dams (32-10-3 W. 5).....	40,000							
Bobs creek.....	25,000							
Callum creek.....	20,000							
Damon creek.....	5,000							
Heath creek.....	15,000							
Pincher creek.....								
Playle creek.....	5,000				11,275	15,000		
Racehorse creek.....	25,000							
Sharples creek.....	15,000							
Willow creek—								
Burke creek.....						10,000		
Burton creek.....						5,000		
Chaffin creek.....						10,000		
Johnston creek.....						10,000		
Kuntz creek.....						5,000		
Lyndon creek.....						15,000		
Nelson creek.....						5,000		
Patterson creek.....						5,000		

WATERTON LAKES HATCHERY—*Concluded*

	Cutthroat trout advanced fry	Cutthroat trout No. 1 fingerlings	Cutthroat trout yearlings	Cutthroat trout 2 year olds	Rainbow trout advanced fry	Rainbow trout No. 1 fingerlings	Rainbow trout No. 2 fingerlings	Rainbow trout yearlings
Old Man river— <i>Concluded</i>								
Willow creek— <i>Concluded</i>								
Riley creek.....						5,000		
Trout creek.....						15,000		
Westrup creek.....						5,000		
Willow creek, north fork.....						15,000		
Willow creek, south fork.....						15,000		
St. Mary's river—								
Lee creek.....	15,000							
Tough creek.....	15,000							
Waterton lake (lower).....		20,000						
Waterton lake (upper).....		28,000						
Waterton river—								
Beaver dams (22-30 W. 4).....						5,000		
Beaver dams (27-30 W. 4).....						5,000		
Carpenter creek.....	20,000							
Cottonwood creek.....		25,000						
Drywood creek.....	25,000							
Hatchery creek, above dam.....	6,000						333	
Pass creek.....						15,000		
Pine creek, south fork.....					6,000			
Smith creek, above falls.....			380					924
Spring creek.....	5,000			173				
Stoney creek.....								
South Kootenay creek.....	6,000							
Trail creek.....	10,000							
Yarrow creek.....	15,000	30,000						
Yarrow creek, north fork.....								
Yarrow creek, south fork.....						5,000		
	432,000	103,000	380	173	18,275	292,000	333	924

Total distribution..... 847,085

BRITISH COLUMBIA  
ANDERSON LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon advanced fry	Sockeye salmon No. 1 fingerlings	Spring salmon No. 1 fingerlings	Spring salmon No. 4 fingerlings
Anderson river.....				159,832	18,619
Anderson lake.....			220,000		
Adlem creek.....		220,000	220,000		
Boulder creek.....		220,000			
Cedar creek.....			220,000		
Clemens creek.....			233,417	1,997	
Falls creek.....			220,000		
Four Mile beach.....		220,000			
Eight Mile beach.....		220,000			
Ternan creek.....			1,997		
Hillier creek-Maggie lake.....	1,001,000				
Sproat lake—					
Taylor river.....	2,002,000				
	3,003,000	880,000	1,115,414	161,829	18,619

Total distribution..... 5,178,862

BABINE LAKE HATCHERY

	Sockeye salmon fry	Sockeye salmon No. 1 fingerlings	Sockeye salmon No. 2 fingerlings
Morrison creek—Babine lake.....		339,714	608,449
Morrison lake.....	4,877,587		
	4,877,587	399,714	608,449

Total distribution..... 5,885,750

BEAVER LAKE EYEING STATION

	Kamloops trout fry
Beaver lake.....	218,442
Kelowna rearing ponds—Mission creek.....	25,000
	243,442

Total distribution..... 243,442





[illegible]

Total distribution.....	2,048,065
-------------------------	-----------

## CULTUS LAKE HATCHERY

	Cutthroat trout eyed eggs	Cutthroat trout fry	Kamloops trout eggs	Kamloops trout fry	Sockeye salmon eyed eggs	Sockeye salmon fry	Steelhead salmon No. 2 fingerlings	Steelhead salmon No. 3 fingerlings	Steelhead salmon No. 5 fingerlings	Steelhead salmon yearlings
Cultus lake.....										
Davis lake-Stave lake.....	20,000									
Ford lake-Chilliwack river.....			39,975							
Grace lake-Harrison river.....			20,000							
Hatzic lake-Fraser river.....	20,000									
Kanaka creek-Fraser river.....	20,000									
Lamont lake-Harrison lake.....			4,000							
Little Sumas river-Fraser river.....	20,000									
Liumehin creek-Vedder river.....	15,000									
Long Island lakes-Harrison lake district—										
Barnet lake.....		3,044								
Cornet lake.....		3,044								
Frederick lake.....		3,045								
Mount Olie, B.C. (private water),										
W. J. McNab, Esq.....				4,000						
Popkum lake-Fraser river.....		15,000								
Ruskin reservoir-Fraser river.....	20,000									
Spring creek-Cultus lake.....					624,438					
Stave lake-Fraser river.....	30,000									
Sweltzer creek-Vedder river.....										
Wolf lake-Harrison river.....			10,000				83,328	1,550	3,587	346
	110,000	59,133	73,975	4,000	624,438	3,943,966	83,328	1,550	3,587	346

Total distribution.....	4,904,323
-------------------------	-----------

## DEPARTMENT OF FISHERIES

## KENNEDY LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon advanced fry	Sockeye salmon No. 1 fingerlings	Sockeye salmon No. 2 fingerlings	Sockeye salmon No. 3 fingerlings
Kennedy lake—					
Clayoquot Arm—					
Calm bay-Conger creek.....		215,000			
Cedar creek-Peter bay.....		250,000			
Deer beach-Narrows.....			80,605	80,000	
Duck island.....				10,000	
Duck island-Loon bay.....		150,000			
Duck island-Martin creek.....		261,000			
Loon bay-Martin creek.....				12,000	
Martin creek-Peter creek.....					14,185
Fir creek-Yew creek.....		200,000			
Log bay-Yew creek.....			29,511	15,000	
Grassy bay-Deer beaches.....		200,000			
Irvin creek-Deer beaches.....				10,000	20,959
Green bay-Irvin bay.....		200,000			
Hatchery beach.....			4,500	30,000	21,399
Little Pond creek.....				45,000	23,088
Pond creek.....			110,000	195,000	63,134
Pond beach.....			175,000	99,683	
Rocky bay-Cosy bay.....		220,000			
Rocky bay-Deer beaches.....			60,000	80,000	
Silent bay and vicinity.....		220,000	175,000		
Otter creek-Charlie creek.....		220,000			
Charlie creek-Ucluelet bay.....		250,000			
Ucluelet bay-Snag bay.....		200,000			
Ucluelet bay.....			150,000		
Grant creek and south.....			179,993		
Narrows-Halfway point.....		250,000	75,000		
Shallow bay-Norger bay.....			200,000		
Kennedy river.....			186,877		
Olsen's bay.....		145,000			
Sutton's slough.....		220,000			
Muriel lake—					
David creek.....	1,038,795				
Upper Kennedy river (Elk).....	947,180				
	1,985,975	3,201,000	1,426,486	576,683	142,765

Total distribution..... 7,332,909

## LAKELSE LAKE HATCHERY

	Cutthroat trout No. 1 fingerlings	Sockeye salmon fry	Sockeye salmon No. 1 fingerlings	Sockeye salmon yearlings
Lakelse lake.....		2,450,000	120,000	354
Granite creek.....	38,700	235,490		
Salmon creek.....		173,830		
Scullabuchan creek.....		1,400,000		
Williams creek.....		1,073,200		
	38,700	5,332,520	120,000	354

Total distribution..... 5,491,574



## LARDO SUB-HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry
Kootenay lake-upper end.....		64,200
Lardeau river-around shores.....	230,000	
	230,000	64,200
Total distribution.....	294,200	

## LLOYDS CREEK HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry
Biological Board, Taft, B.C.....	100,000	
Hope district—		
Coquihalla river.....	20,000	
Kelly lake.....	20,000	
Pavilion lake.....	30,000	
Silver creek.....	20,000	
Kamloops district—		
Beaver lake.....		5,000
Fish lake.....		257,600
Knough lake.....		150,000
Paul lake.....		200,000
Pinantan creek.....		150,000
Spring creek-Walloper lake.....	25,000	
Kelowna Rod and Gun Club-rearing ponds.....	50,000	
Nisconlith lake-South Thompson river.....		33,000
Peace river district—		
Charlie lake.....	100,000	
Shuswap district—		
Canoe creek-Shuswap lake.....	60,000	
Granite creek-Shuswap lake.....	72,000	
Renicker creek-Shuswap lake.....	48,000	
Salmon river-Shuswap lake.....	60,000	
Palmer creek-Salmon river.....	72,000	
Vancouver island—		
Cameron lake.....	60,000	
Great Central lake.....	60,000	
Sproat lake.....	60,000	
	857,000	795,600
Total distribution.....	1,652,600	

## DEPARTMENT OF FISHERIES

## NELSON HATCHERY

	Cut-throat trout eyed eggs	Kennerly's salmon eyed eggs	Kennerly's salmon fry	Kamloops trout eyed eggs	Kamloops trout fry	Kamloops trout No. 3 fingerlings	Speckled trout eyed eggs	Speckled trout fry
Creston district—								
Meadow creek-Kootenay river.....							20,000	
Grand Forks district—								
Wallace lake.....					6,000			
Greenwood district—								
Boundary creek-Kettle river.....							16,000	
Christina lake.....		150,000						
Jewel lake.....					20,000			
West Kootenay—								
Arrow creek-Goat river.....	14,000							
Arrow lake-lower (at Edgewood)				20,000				
Beatrice lake-Slocan lake.....				20,000				
Beaver creek-Columbia river.....								12,000
Big Sheep creek.....								16,000
Bjerkness creek-Kootenay lake.....				8,000				
Boundary lake.....								34,512
Box lake.....				20,000				
Cahil lake.....				20,000				
Champion lake.....	14,000							
Cottonwood lake.....					25,000			
Crawford bay-retaining pond (Capt. Hincks).....					2,000			
Fletcher creek-Kootenay lake.....	10,000							
Goat river.....	20,000							
Inonoaklin river.....								12,000
Kaslo creek, south fork.....								20,000
Kaslo lake.....	8,980							
Kokanee creek-Kootenay river.....		150,000	61,000					
Kokanee lake.....	6,000							
Kemball lake.....				10,000				
Marble lake.....	4,000							
Rockslide lake-Kootenay river.....				10,000				
Salmon river.....				20,000				
Sitkum creek-Kootenay river.....			40,000					
Six Mile creek-Kootenay lake.....						1,200		
Six Mile creek-Kootenay river.....			50,000					
Six Mile lake.....				10,000	15,000			
Slocan lake.....		100,000		20,000				
Slocan pool.....					20,000			
Slocan river.....				20,000				
Snow creek-Arrow lake.....				20,000				
Springer creek-Slocan lake.....								
Sproule creek-Kootenay river.....			60,907					
Tanal lake.....	10,000							
Wheeler lake.....	12,000							
Unnamed creek-Lower Arrow lake, Robson, B.C., retaining pond (Mr. F. E. Osborne).....					1,000			
Wilson lake.....		75,000						
Kootenay lake-West Arm.....					11,905			
Kootenay river-West Arm.....					15,000			
Westminster district—								
Jones lake, near Hope.....		50,000						
	98,980	525,000	211,907	218,000	115,905	1,200	36,000	94,512

Total distribution..... 1,301,504

## PEMBERTON HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry	Sockeye salmon fry
Alta lake.....		28,560	
Birkenhead river.....			21,330,000
Brennen lake-Howe Sound.....	10,000		
Burns lake-Prince George district.....	40,000		
Conroy lake-Cheakamus river.....		7,390	
Henrietta lake-Howe Sound.....	10,000		
Horse lake-Quesnel district.....	30,000		
Kinney lake-Prince George district.....	40,000		
Lac La Hache.....	20,000		
Lucille lake.....	10,000		
Lower Owl creek lake.....	10,000		
Upper Owl creek lake.....	10,000		
Ogre lake-Kootenay district.....	10,000		
Tranquille lake-Kamloops district.....	20,000		
Williams lake-Quesnel district.....	40,000		
	250,000	35,950	21,330,000

Total distribution.....21,615,950

## PENASK LAKE HATCHERY

	Kamloops trout eyed eggs
Charlie lake-Peace river block.....	100,000
Kelowna ponds-Mission creek (Kelowna Rod and Gun Club).....	25,000
Powell lake-North Vancouver district.....	40,000
Stanley Park hatchery (Provincial Government).....	100,000
	265,000

Total distribution..... 265,000

## PITT LAKE HATCHERY

	Coho salmon yearlings	Cutthroat trout eyed eggs	Sockeye salmon fry	Sockeye salmon No. 1 fingerlings
Pitt river—				
Boise creek.....			640,000	
Charles Peter's slough.....			640,000	
Four Mile creek.....			442,145	199,680
Four Mile slough.....	489		640,000	
Seven Mile creek.....			640,000	
Small creek-Bernice lake (Dewdney district).....		19,810		
	489	19,810	3,002,145	199,680

Total distribution..... 3,222,124

## QUALICUM BEACH PONDS

(Provincial)

	Atlantic salmon No. 4 fingerlings	Loch Leven trout No. 3 fingerlings	Loch Leven trout No. 4 fingerlings
Biological Research.....	100		400
Cowichan lake.....	14,716		
Little Qualicum river.....		3,428	13,019
Whiskey creek-Little Qualicum river.....		15,490	37,292
Little creek-Whiskey creek.....			5,639
	14,816	18,918	56,350

Total distribution..... 90,084



## DEPARTMENT OF FISHERIES

## RIVERS INLET HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry	Spring salmon fry	Spring salmon No. 4 fingerlings
Owikeno lake.....		708,714		34,725
Asklum creek.....		1,100,625		
Cheo river.....		901,527		
Dallick river.....		1,027,202		
Genesi creek.....	2,619,565			
Medowse creek.....			504,400	25,000
Nookins river.....	998,000			
Second Narrows.....		792,240	330,768	
Quap creek.....	517,780	3,002,476		
Shumahault river.....	2,616,685			
Wauquash river.....		922,773		
Nanaimo river, draining the 2nd Nanaimo lake.....	1,006,625			
	7,758,655	8,455,557	835,168	59,725

Total distribution.....17,109,105

## SMITHS FALLS HATCHERY

Cultus lake.....	Sockeye salmon fry 807,000
Total distribution.....	807,000

## SPROAT RIVER EYEING STATION

Somass river— Stamp river-Alberni District.....	Spring salmon eyed eggs 323,015
Total distribution.....	323,015

## SUMMERLAND HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry	Kennerly's salmon fry
Okanagan district—			
Dog (Skaha) lake.....		20,000	
Island lake.....		16,224	
Kalamalka lake.....		35,000	
Kelowna ponds-Mission creek (Kelowna Rod and Gun club.)		40,000	
Vasseaux lake.....		12,000	
Woods lake.....		15,000	
Okanagan lake.....			239,250
Shuswap river—			
Mable lake.....	50,000		
Sugar lake.....	20,000		
Similkameen river—			
Missoula lake.....	20,000		
Nickle Plate lake.....		15,000	
Princeton Rod and Gun Club.....		3,000	
Wolf lake.....	20,000		
	110,000	156,224	239,250

Total distribution..... 505,474

## TLELL RIVER EGG COLLECTING STATION

Biological Board— McClinton creek hatchery.....	Pink salmon green eggs 695,246
Total distribution.....	695,246

## APPENDIX No. 4

### ENGINEERING BRANCH

#### REPORT BY CHAS. BRUCE, A.M.E.I.C., FISHERIES ENGINEER

The Engineering Branch is responsible for all works of a technical nature undertaken by the department. These are classified and reviewed in detail hereunder.

All work of the branch in British Columbia is under the direct supervision of Resident Engineer John McHugh, with headquarters at Vancouver.

#### BUILDING FISHWAYS AND CLEARING RIVERS

##### NOVA SCOTIA

*Tusket River, Yarmouth County.*—The situation at the dam on Tusket falls again caused much concern as while the fishway was efficient for passing alewives, which ascended in immense numbers, salmon, particularly the early run fish, did not leave the large pools some 100 yards below the dam. At a conference attended by representatives of the local people interested, the Nova Scotia Power Commission, owners of the dam, and the department, it was decided after an inspection of the dam to open up a large channel from the pools, above referred to, to the foot of the dam and build a wind wall to keep the water in this channel, the commission agreeing to remove a part of a log sluice which it was thought might interfere with ascending salmon. This work was undertaken during the summer when water conditions were most suitable, but its efficiency will not be fully ascertained until next year.

*Mersey River, Queens County.*—The McLeod Pulp Company, owners of an unused dam at Cowie's falls, agreed, after negotiations, to make an opening through it as it was in such a poor state of repair that the fishway did not function effectively. After this work was completed it was necessary for the department to improve the river bed below to provide an adequate channel for ascending fish during low water conditions.

*LeHave River, Lunenburg County.*—Some small modifications were made to the fishway in the Wentzell dam to render it efficient during low water conditions. This was, however, not entirely completed, due to high water when the work was undertaken.

*Gaspereaux River, Kings County.*—Owing to the difficulty experienced through loss of both adult and young fish, descending through the turbines at the Whiterock power plant, it was decided to try as an experiment a hanging type of screen, which was developed in the department. The owners of the plant met the greater part of the cost of the screen but it was erected under engineering supervision. The efficiency of this screen, which is a new departure, designed to overcome if possible the difficulties always present when any obstruction is placed over a power intake, will not be known until next year.

*Shubenacadie River, Hants County.*—An unusual situation developed in this river when, due to extreme low water, numerous young alewives were trapped in heavy growths of grass, where they were being destroyed by eels. A channel was made through these grass areas permitting the free descent of fish.

*Catalone Lake, Cape Breton County.*—A small obstruction in the outlet stream which prevented the ascent of fish was removed, and a rock fall, which retarded fish during low water, was improved by blasting.

*Lake Enon, Richmond County.*—Several obstructions in the outlet stream from this lake were removed to facilitate the passage of fish between it and Loch Lomond lake.

*McInnes Brook and Front River, Inverness County.*—Small channels were cut through gravel bars which had formed at the mouths of these streams to permit the ascent of numbers of sea trout for spawning.

#### NEW BRUNSWICK

*Nashwaak River, York County.*—An apron was again built below the waste gate in the dam at Marysville to improve the conditions for ascending salmon.

*Magaguadavic River, Charlotte County.*—Since the large fishway at the mouth of this river proved efficient for salmon, the local Fish and Game Association urged that improvement should be made at Second falls, some ten miles up the river, where the fish were retarded in their ascent. The association agreed to perform all the labour if the department would provide explosives. The work, consisting of blasting off the top of the falls, was completed during the low water period, under departmental supervision.

*Buctouche River, Kent County.*—An examination was made of a fishway which the owners, without receiving information from the department, had built in a driving dam. While it was reported that salmon had ascended, approval of the fishway is being withheld until the results of its operation next season are observed.

#### BRITISH COLUMBIA

*Demannual Creek, V.I.*—This creek, which flows into the Sooke river near Sooke, V.I., was badly obstructed with a huge log jam as a result of freshets. Action was taken for its removal and every advantage taken of a spell of fine weather and low water, as a result of which burning proved very effective in removing the major portion of the jam. Salmon have since been able to proceed to the upper waters of this stream without hindrance.

*103rd Creek, V.I.*—This creek, which flows into Ladysmith harbour, V.I., was badly obstructed with a huge log jam as a result of freshets. Before arrangements could be completed for its removal by the department, the presence of the jam threatened the safety of both the provincial highway and the E. and N. Railway crossing of this creek and it became necessary for the provincial Government to take immediate action to remove the jam. This department was thus saved the cost of doing this work as a result of which salmon now have access to the upper waters of this stream.

*Chilcotin River.*—A careful examination was made of the Farwell Bridge canyon of the Chilcotin river, an important feeder of the upper Fraser, on receipt of reports that sockeye had been held up in the canyon during the previous season. This examination revealed the fact that no physical changes had occurred in the canyon within recent years. There was no evidence whatever of slides or disturbance of the river bed. There was, however, evidence of very swift and broken water under certain conditions of flow which, in all probability, delayed progress somewhat in that year. This is to be expected in the canyons of the Fraser river, many of which present difficulties under certain conditions to ascending salmon. There are, however, stages during which such difficulties disappear and progress then becomes possible.



*Quinsam River.*—The Quinsam river, which drains into Campbell river on the east coast of Vancouver island, received a careful examination during the year. This river, approximately twenty-three miles in length, drains three lakes, Upper, Middle and Lower Quinsam. Upper Quinsam lies at an elevation of 1,200 feet above sea level and the river falls this distance in its descent to the sea. Four varieties of salmon and the steelhead are known to enter and spawn in the river, and springs and cohoes are known to reach a point about a mile below the outlet of the lower lake. Between this point and the outlet of the lake is a drop of about 190 feet in a series of cascades and it was desired to ascertain whether it would be possible to so improve this stretch that salmon could proceed into Lower Quinsam lake and take advantage of the available spawning areas in the upper section. This was found to be feasible, though the cost would be very heavy, since the work would consist of cutting graded channels through the rocky bed of the stream in places and constructing baffle walls of concrete to retard the current. Furthermore, this examination revealed the fact that a 30-foot fall exists in one place in that section of the river between the middle and lower lakes, which would arrest further progress until it had been overcome.

Opening up the Quinsam river to the further progress of salmon will involve extremely heavy expenditure and it will be necessary to determine whether the benefits which would accrue from the work would be commensurate with the cost. The matter is still under consideration.

*Quamichan River.*—This stream, which drains Quamichan lake and enters the Cowichan river near its mouth, was inspected for the purpose of ascertaining whether it would be possible to open up the falls near its mouth for the passage of trout, which residents on the lake shore had stated were impassable. It was found on inspection that the falls could be made passable with very little expenditure, but that if the change were made the lake would become accessible to other fish (salmon and catfish) which it was not desired should be admitted. This matter is receiving further consideration.

*Kutla Creek.*—A log jam which prevented the ascent of salmon to the spawning grounds was removed from the bed of the above stream which drains into Riley's cove, Tofino inlet. The jam was located about one-half mile from the mouth of the stream. Coho salmon are now able to pass up the stream and into the lake at head of the stream, where they spawn.

*Ingram Lake Falls.*—Two visits were paid to these falls, which are at the mouth of Ingram creek which flows into Eilerslie channel at its head. The falls, eighteen feet in height, over a distance of forty-five feet, have always presented a barrier to ascending salmon and it has been suggested that they should be made passable in order to open up and utilize a new spawning area of lakes and streams which are at present barren of salmon life. These lakes and streams are reported to contain areas of good gravel suitable for spawning grounds, which might, if made accessible, support a large run, once such a run were established. It was found, however, that to overcome the falls an expenditure of approximately \$3,000 would be required to install a suitable fishway, and it was not considered expedient at the present time to proceed with the scheme.

*Minor Obstructions.*—Minor obstructions consisting of log jams, boulders, and other debris were removed from the following streams, with the assistance of help procured in the locality, and under supervision of the local officer: Ditmar creek, Nelson island; and Murphy creek, Jervis inlet, Pender Harbour district.

Small quantities of explosives were furnished local officers for work to be done by themselves and their boat crews on the following streams, to make

openings in jams and to remove logs which interfered with the free passage of salmon: Docee river and Takoosh river, Smiths inlet; Birkenhead river, Lillooet district; Big Qualicum river, Hunt creek and Coal creek, East Coast Vancouver Island.

Inspections and reports were made and compiled in connection with the following streams where obstructions had been reported: Beaver creek, Canoe Pass creek, Summers creek, Dutchman's Harbour creek, Round creek, Ward creek and Fish creek, Alberni Area, District No. 3; Simoon Sound creek and Tracy Harbour creek, Alert Bay Area, District No. 3; Davis creek, District No. 1.

An obstruction consisting of a disused jam and a quantity of logging debris was removed from the bed of the stream draining into Sullivan bay, by the owners of the dam at no cost to the department.

## FISH CULTURAL ESTABLISHMENTS

### NOVA SCOTIA

*Margaree Hatchery.*—A small natural brook channel on the hatchery property, some 650 feet long, which has been used for several years as a rearing pond, was deepened and fitted with a series of screen baffles to increase its efficiency for holding young fish.

*Margaree Salmon Pond.*—In order to provide a holding pond for early run salmon in the Margaree river a pound-net was set in the estuary. As no equipment was available a small pile driver and scow were taken to Margaree from Morell, Prince Edward Island, by one of the fisheries protection steamers. The pound was successfully set in time for the first run of salmon.

*Lindloff Hatchery.*—The hatchery building was repaired by the introduction of new sills, joists and flooring.

*Antigonish Hatchery.*—Two circular rearing ponds, each twenty-five feet in diameter and two feet deep at the centre, were excavated and the requisite water supply flumes and drainage systems installed.

*Bedford Hatchery.*—Eight rearing ponds, each four feet wide and varying in length from twenty-nine feet to thirty-six feet, were built to complete a series, which now comprises fifteen ponds. The construction throughout was concrete with the requisite reinforcing. A small circular pond was built by the hatchery superintendent and repairs were effected to the walls of the canal, which is used as a retaining pond for parent salmon.

*Middleton Hatchery.*—Boundary lines were re-established over a portion of the hatchery property which was enclosed with wire fencing. The icehouse was enlarged by an extension 8 feet by 10 feet and a cold room installed.

*Nictaux Salmon Pond.*—Twenty hatching troughs, each sixteen feet long, with the requisite supply trough, were made and set up on the land adjoining the pond, to be used for rearing fingerlings. The work included foundations, trestles and a roof over the system to provide shade. The water supply was conducted to the head trough by a 6-inch wood stave pipe line. A small shed with concrete floor was erected to provide facilities for grinding and storing food for the fish retained in the troughs.

*Yarmouth Hatchery.*—Two small concrete dams were built in the outlet stream from lake George, where it passes along the boundary of the hatchery property, to provide ponds for retaining brood trout. The property boundaries were re-established and a wire fence erected between it and the adjacent farm.



## NEW BRUNSWICK

*Saint John Hatchery.*—The series of forty-eight wooden rearing tanks, built the year previous, were reinforced with stay rods, to prevent warping of the sides, and a gate was installed at the head of the water supply line to these tanks. Extensive repairs were necessary to the concrete walls of the large rearing pond system, where the action of frost had caused serious erosion during the several years since they were completed.

*Tobique Hatchery.*—As the original wooden posts supporting the hatchery building had become so rotted that settlement was taking place, stone piers were erected to replace them. The hatchery was equipped with ten new hatching troughs and a new supply trough, and some small repairs were made to the water supply dam.

*Grand Falls Hatchery.*—When it was desired to fence the portion of the hatchery property on the far side of the railway, it was found that an old road allowance crossed over a part of this land. Arrangements were made with the Provincial Highway Department whereby the Fisheries Department acquired sufficient land adjacent to the hatchery property for a road diversion and the Provincial Department will open up and maintain the road, thus avoiding interference with lands required for hatchery purposes.

## PRINCE EDWARD ISLAND

*Kelly's Pond Hatchery.*—Three rearing tanks each eleven feet long, two and one-half feet wide and fourteen inches deep were built and set up for rearing fry.

*Morell Salmon Pond.*—In order to facilitate operations at this pond it was necessary to secure additional property, a survey of which was made by the Engineering Branch. The net wings of the salmon retaining trap having rotted beyond further use, it was decided to replace them with wood slats. Thirty-one panels to provide for a fence 400 feet long were constructed. They are removed in the fall when operations are over for the season.

## BRITISH COLUMBIA

*Skeena River Hatchery.*—The annual report of this branch for the year 1932 referred to a serious wash-out on the Skeena River Hatchery road in the vicinity of the hatchery. It was impossible to do anything in the way of extensive repairs at the time and it was not until May of the year under review that the repair work was commenced. Meantime, the functions of the establishment were carried on without interruption in spite of the extraordinarily difficult conditions. The men employed on the 1933 work were all residents of the district and an equipment of tools was kindly loaned by the Public Works Department of the province.

An entirely new location on higher ground was found for that section of the road which had to be rebuilt. It follows the foot of the side hill along the north side of the valley, down stream from the hatchery, at an average height above the creek bed of five feet. The new road is well clear of any danger of high water. The total length of road constructed measures 2,200 feet and it has minimum width of ten feet. The road winds along the side hill with easy curves and good grade. Considerable solid rock was encountered in excavation, the heaviest rock cutting being a seven-foot cut for fifty feet. The road is well ditched on the upper side to take care of seepage from the side hill, and culverts were put under the road at low points. It was not possible with the funds available to surface the road with gravel but the road-bed is built of good material, is solid, and gravelling can be done later.



In addition to the road work a rock filled crib 95 feet long,  $6\frac{1}{2}$  feet wide, and 7 feet high was built along the hatchery side of the creek, replacing an old crib washed out in the fall freshet, and extending the bank protection up stream. The crib was constructed of sound cedar logs cut on the hatchery reserve, fastened together with  $\frac{3}{4}$ -inch iron drift bolts and filled with heavy boulders, brush, and gravel.

*Summerland Hatchery.*—The capacity of this establishment was doubled by the addition of eight new hatching troughs and the necessary fittings.

*Cultus Lake Hatchery.*—*Repairs to Fences Sweltzer Creek.*—Winter freshets, 1932-1933, were the cause of a portion of the Vedder river breaking through into the valley of Sweltzer creek and partially demolishing the three counting fences maintained there for experimental work in connection with the Cultus Lake hatchery by the Biological Board. These fences were repaired during the season of low water in August. The work necessitated the services of a pile driver for foundation work. Thirty new piles were driven and the framing of the fences completed, after which the rock filling and bank protection work was completed. The impounding fence in the vicinity of the hatchery also received minor repairs.

*Penask Hatchery.*—The Penask hatchery was visited in order to secure data for preparation of a report on the spawning fences on Penask creek.

*Rivers Inlet Hatchery.*—Repairs were made to the Quap Creek fence which was washed out during the winter of 1932-33. It was necessary for an engineer to visit the ground and lay out the work which was done under supervision of the hatchery superintendent.

*Tl-ell River Fence, Queen Charlotte Islands.*—This fence, which is operated by the Biological Board in connection with its pink salmon investigations, was replaced during the year. The work was carried out under the direct supervision of an engineer.

*Beaver Lake, Kelowna.*—An inspection was made here by this branch and a report and plan prepared in connection with the proposal to construct a spawning fence for trout at the lake. The report was submitted to the department but action towards construction has been deferred.

*Cowichan Lake Hatchery.*—*Renewal of Pipe Line.*—For several years this pipe line has been showing signs that its replacement at no distant date would be necessary. The line, 2035 feet in length from dam to hatchery, was of the low-head inserted joint type, of wire-wound wood pipe, and serious leaks developed at many of the joints, which caused a great shortage of water during the summer months when the supply is low. Authority was procured to renew the pipe and work was commenced in September last. Because of the fact that the ponds were occupied by young fish it was necessary to maintain the flow in the old pipe line whilst the new one was being laid. A parallel trench was excavated along the old line, exposing it for the greater part of its length, and the new pipe laid alongside the old one. Connections were made through the dam and a new intake constructed and the pipe was finally laid to the hatchery after which connections were broken on the old line, and the new line connected up.

## CO-OPERATIVE FISH CULTURE

### NOVA SCOTIA

*Waverley Brook Ponds.*—The Nova Scotia Fish and Game Protective Association proceeded with the construction of nine rearing ponds at this site, surveys for which had been made the year previous, by a departmental engineer. The work included, in addition to the ponds each of which is 100 feet long and

about four feet wide, the construction of a rock filled timber dam about 100 feet long and six feet high, with a fishway through it, to provide a water supply for the ponds, as well as the construction of an icehouse and feed room. All the work was laid out by an engineer and was completed under the supervision of a departmental construction foreman.

GAME DEPARTMENT (BRITISH COLUMBIA GOVERNMENT)

*Qualicum Ponds, V.I.*—Co-operating with the Game Department of British Columbia, a careful survey of the facilities available for fish culture at Qualicum beach was made, and it was recommended to the province that the old pond be demolished and an entirely new unit constructed. Funds were made available for this work by the British Columbia authorities, and plans and specifications were prepared by this department. These plans provided for the demolishing of the old works, the diversion of the creek which provides the water supply, and the construction of four wooden ponds each measuring 40 feet by 6 feet by 3 feet deep, stepping down to 3 feet, 6 inches, all built on suitable foundations. Each pond was provided with its own separate water supply from a supply tank connected with the creek and a triple row of 2-inch by 6-inch sheet piling was driven across the creek bed for a distance of 140 feet to control the creek and to conserve and retain the flow of several small springs which normally drained into the creek and were wasted.

Work was commenced in the month of February and was completed in March (an additional pond being added, making five in all). The work throughout was under the superintendence of this department.

As soon as the ponds were completed they were occupied by brown trout and Atlantic salmon fry. The ponds are reported to have given good satisfaction during the year.

*Stanley Park Hatchery and Retaining Ponds.*—The situation at Stanley park where there is a constant overflow from the Stanley Park reservoir was investigated with a view to erecting a modern hatching and rearing plant, and as a result plans of a hatchery building, fully equipped, and sixteen rearing tanks each 15 feet by 4 feet 3 inches, by 3 feet deep were prepared and submitted for approval.

Authority for the construction of this plant was obtained and work was commenced by day labour, the facilities of this department being used for the purchase of all material and the conduct of the work being under the direct supervision of this branch.

The work was completed in June and the hatchery was filled with trout eggs, which when they were developed into fry were placed in the rearing tanks.

An 8 inch wooden stave pipe line from Beaver creek furnishes the water which feeds separately into the hatchery and each of the tanks.

*Kelowna Rearing Ponds.*—An engineer in company with Provincial Game Commissioner A. Bryan Williams, and at his request, paid a special visit to Kelowna for the purpose of advising him with regard to future development at this point.

*Veitch Creek, Spooke Harbour, V.I.*—An examination was made of this creek with a view to duplicating the service given at Stanley park, Vancouver, for the raising of trout for distribution in Vancouver Island waters. The creek drains into Sooke harbour and whilst its flow becomes quite restricted in summer months, it may be possible by arrangement with Victoria city to boost the supply from that city's water supply, which is derived from Sooke lake and whose pipe line crosses the upper reaches of Veitch creek. Conferences were held with city water officials and records of creek flow procured by the Provincial Water Rights Department on the strength of which the Game Department purchased a piece of land on the banks of the stream on which the plant can be constructed. No



further development on this project is contemplated at present although the question of water supply is still receiving attention. A contour survey of the valley has been made by British Columbia government engineers with a view to preparing an estimate on the cost of providing water storage during critical periods. If the water supply can be taken care of this should prove a splendid location for what is required, being convenient to the highway and only a few miles from Victoria.

*Nelson Island.*—In company with officials of the Game Department, an engineer visited a point on Nelson island, Agamemnon channel, for the purpose of securing data for an estimate of the cost and means to be adopted for securing a collection of cutthroat trout eggs in the spring of 1934. The estimate was prepared and the figures handed to the Game Department.

*Crambrook Hatchery.*—A special visit was made to this establishment, newly constructed by the local fish and game association, for the purpose of advising with regard to water supply, control, and distribution.

#### GENERAL

*Surveys.*—Instrumental surveys were made at Grafton brook and Lower Great brook in Queens county, N.S., to determine the suitability of proposed sites at these points for the establishment of rearing pond systems. Similar surveys were also made at Indian brook on the LaHave river, Lunenburg county, and at Jobs pond near Stewiacke in Colchester county.

*Fishing Boundary Signs, Area No. 17 (Fraser River).*—The establishment of a seining area north of the 49th parallel in the gulf of Georgia necessitated the establishment of a boundary line with boundary signs on the direct line between a point three-quarters of a mile south of Canoe pass and Gabriola pass. The position of this line was established and a large triangular boundary was placed on the dyke below Canoe pass which was visible for several miles. Three cedar telephone poles 45, 50 and 60 feet long were placed in holes 8 feet deep dug in the dyke and guyed with wire rope, and a triangular boundary sign with sides 12 feet in length was bolted to their tops, about 35 feet above the top of the dyke. A second sign was then placed on the boundary line at the point where the sand heads shelve off into deep water. Here it was necessary to use a pile driver to drive three sixty-foot piles in a row at five foot centres surmounted by a triangular sign similar to that on the dyke.

*Pollution, Comox Lake.*—A further examination into the question of pollution at Comox lake, as a result of coal mining operations, was conducted during the year in co-operation with officers of the Biological Board. According to reports by the board's chemist, the pollution could be mitigated considerably if the effluent from the mines were exposed to the action of the air for sufficiently long periods to oxydize the deleterious material in solution so that it would precipitate and finally deposit itself. The cost of pipe lines to adequately dispose of the effluent would require very heavy capital expenditure, which, under present conditions, the company would not be prepared to undertake. It was therefore arranged to lay out in plans a series of suitable ditches on satisfactory grades to assure slow though continuous movement and to ascertain the best possible arrangements for disposal of the refuse as it was deposited. A full report and plan of the proposed layout was submitted.

*Salmon Investigation.*—In company with Biological Board officers an examination was made of certain waters north of Seymour narrows for the purpose of advising the department in connection with a proposal to intercept sockeye salmon on their journey south to the Fraser river and to impound them in salt water until spawning. Deepwater bay and various adjacent waters were visited for this purpose and a full report submitted, with an estimate of cost.



*Float, Departure Bay.*—The question of float renewal at Departure bay and the examination of suitable points on Vancouver island for the location of salt water retaining ponds were investigated.

*Fisheries Stations.*—Reports were prepared in connection with repairs to the fisheries station at Schooner passage, Rivers inlet, and also to the station at Poplar island, Fraser river. These repairs were subsequently carried out by the Public Works Department, under whose jurisdiction, for maintenance, these two stations come.

*Fishways—Deep Creek.*—The fishway designed for incorporation in the privately owned dam at Deep creek, Prince George district, was completed during the year without any expense to this department. This fishway, of standard design, consists of nine separate pools, each rising one foot in height. It is constructed of wood, approximately fifty-five feet in length, and three feet wide in the clear. It is constructed in the form of a "U" thus bringing the entrance within five feet of the base of the dam. Deep creek is a trout stream and trout are reported to have passed through the fishway in large numbers since the work was completed.

*Linklater Creek (Kootenay District).*—Plans were prepared for a fishway on Linklater creek, Kootenay district, of similar size to that on Deep creek, though the layout differs in that it is perfectly straight and connects the pool at the base of the dam with the irrigation flume which leads off at one side of the dam. This fishway has not yet been completed. It is being installed by joint owners of a dam, without any cost to the department, to enable trout to overcome an irrigation dam.

*Irrigation.*—Matters in connection with the screening of irrigation ditches, particularly in the Okanagan district, received considerable attention during the year. Revolving screens have been attended with much success in the United States and it was considered possible that they might be adopted in British Columbia. Cost of installation is, however, a controlling factor, particularly with orchardists, who are bravely struggling against adverse conditions, and finally it was recommended that the older type vertical screens be still adhered to. Arrangements were satisfactorily completed whereby the Department of Indian Affairs agreed to install screens in certain portions of the district in the vicinity of Vernon.

#### SCALLOP INVESTIGATIONS

A detailed report of scallop investigations will be found in Appendix No. 7.

#### LEASING OF OYSTER AREAS

The leasing of unproductive oyster bottom, under the policy adopted by the Federal Government when the administration of the oyster fishery was taken over by agreement from the Provincial Government, was continued during the year. Up to the beginning of the year the applications totalled 109, of which ten leases had been completed. During the year 47 new applications were received and the number of leases had increased to forty-five. Of these, thirty-five are in Malpeque bay, five in Brackley bay, three in Savage harbour, one in Covehead bay and one in Foxley river. A detailed report of oyster cultural work by the department will be found in Appendix No. 6.

#### OFFICE

During the year the various maps relating to fisheries matters were brought up to date.

## APPENDIX No. 5

### REPORT OF INSPECTION OF FISH AND TECHNICAL INSTRUCTION TO FISHERMEN AND FISHERY OFFICERS

BY J. J. COWIE, DIRECTOR

INSPECTION OF SALTED MACKEREL, HERRING, ETC.

The inspection of pickled or salted fish and the barrels or packages in which these are marketed was carried on under authority of the Fish Inspection Act during 1933 by those fishery officers of the department who had previously been trained and qualified for such work.

#### ATLANTIC COAST

As was pointed out in the annual report for the preceding year a very important change in the method of inspection on the Atlantic coast was introduced on the first of June, 1933. Prior to that time such fish as come under the Fish Inspection Act were required to comply with the definite standards as to quality and grading and, while they were subject to inspection before shipment, the shipper was at liberty to ship his fish without inspection if an inspector did not appear in the vicinity at the time. Since the first of June, 1933, however, packers and shippers have been prohibited from shipping or selling such fish, and the packages in which they are packed, unless they have been inspected and officially marked by a qualified inspecting officer.

This change to compulsory inspection had entailed an enormous amount of additional work on the inspecting officers. Indeed, some of them for a time were so overtaxed with inspection work that inspectors from other districts had to be sent to their assistance. Curiously enough, the introduction of this compulsory inspection in 1933 coincided with a rather abnormally large run of mackerel.

As a result of the greatly increased inspection work in the first year, as was to be expected some complaints were received as to the quality of the product inspected and passed by some of the inspectors and several re-inspections were carried out in accordance with the provisions therefor in the act. Notwithstanding this, however, it can be safely stated that taken altogether the fishery officers handled the new work as satisfactorily as could be expected. There is no doubt whatever that with the experience gained during the season of 1933 there will be a more thorough inspection in the next year and fewer complaints as to the quality of either packages or fish.

From the first of April, 1933, to the thirty-first of March, 1934, there were inspected on the Atlantic coast 78,570 empty barrels or packages, 61,209 packages of mackerel, 24,308 packages of herring, 6,793 packages of alewives, 220,660 boxes of smoked round herring, and 13,658 barrels and boxes of oysters, making a total of 405,198 packages inspected. Of that total 857 barrels of mackerel, 505 barrels of herring, 1,000 boxes of smoked herring and four boxes of oysters were found to be below the quality prescribed by the regulations under the Fish Inspection Act and were so marked.

In addition to the inspection of barrels and fish the inspecting officers carried out 4,476 inspections of fish curing establishments with a view to seeing that they were kept in a proper sanitary condition.

#### PACIFIC COAST

The inspection of dry-salted herring was continued during the season of 1933-34 by qualified fishery officers.



In the preceding year, owing to the unsettled conditions in China, the only market for these dry-salted herring, there were not more than 47,148 boxes, containing 400 pounds each, inspected. During the year under review, however, the total inspections rose to 127,126 boxes.

Under the improved system of inspection that was put in effect two years ago, the condition of these herring on arrival in China has been much improved; also the old difficulty with regard to the weight of fish in the boxes on arrival has been practically removed.

#### INSPECTION OF CANNERIES AND CANNED FISH

The inspection of fish canneries, the raw material used, the canning processes and the canned product is carried on by authority of the Meat and Canned Foods Act and the regulations made thereunder.

During the season of 1933 there were operated in the provinces of Nova Scotia, New Brunswick, Prince Edward Island, British Columbia, and in the Magdalen Islands, 282 lobster canneries, 50 salmon canneries, 10 clam canneries and 12 sardine and other canneries.

On the Atlantic coast the canning of lobsters claims the attention of the greatest number of people. While much has been done in the past to bring about improved operating conditions in lobster canneries nothing perhaps has so far been done that is calculated to give such speedy and good results as the systematic grading that was put in force last year.

The grading is carried out by the departmental inspecting officers. Marks are assigned or deducted for the various items falling under construction, equipment, operations, and sanitation. There are graduated increasing minimum total marks from the year 1933 to 1935 and any cannery failing to obtain the minimum marks is not allowed to operate. As a result of the 1933 grading some canneries were not opened while some were allowed to continue after improvements required to bring them up to the minimum were made.

Careful attention was given to testing the weights of lobster meat packed in the cans at each cannery during the season and when lightweight cans were found they were not allowed to be sold until they were marked indelibly with the designation "Underweight."

The inspection of canned salmon on the Pacific coast, as introduced in 1932, was continued in 1933 with increasing satisfaction to all concerned.

The inspection system provides:—

1. That no canned salmon are to be shipped out of the province without inspection.
2. That parcels of canned salmon found to be fresh, firm and well packed are granted an official certificate of approval.
3. That parcels of canned salmon found to be sound and fit for human food but not quite up to the standard required for a certificate are classed as "second quality" and these words are embossed on an additional top attached to one end of the can.

Parcels which fall below the second quality grade are confiscated and destroyed or used by the department for purposes other than human food.

From April 1, 1933, to March 31, 1934, there were inspected 1,395,218 cases of canned salmon of all kinds. Of that number 1,376,734 cases were granted certificates of approval, 17,311 cases were found to be of second quality and were so marked, 1,173 cases were found to be below second quality and were confiscated, making a total of 18,484 cases which fell below the certificate grade.

Prior to last year the federal department experienced some difficulty in enforcing fully the requirements of the Meat and Canned Foods Act and the regulations as it had no jurisdiction over a canned product packed in any one province for consumption within that province. The Provincial Governments



of British Columbia, Nova Scotia, New Brunswick, and Prince Edward Island, however, were good enough to have legislation passed in 1932 which gave the force of law in the various provinces to the provisions of the Meat and Canned Foods Act in so far as it was within their legislative competence to do so. The three last-named provinces also took similar action with respect to the Fish Inspection Act. Subsequently, the regulations and amendments that have so far been made under these acts were adopted and given the force of law by proclamation.

#### INSTRUCTION IN FISH CURING

During the cod fishing season of 1933 instruction was given to fishermen in certain sections of the Atlantic coast in the Gaspé style of curing and in other sections in the curing of cod in pickle and the making of boneless fish.

*Gaspé Cod Curing.*—Two qualified instructors were employed for this work, one at the Magdalen Islands and the other in the county of Gloucester, New Brunswick. The work of instruction was started at the Magdalen Islands on the 9th of May and was continued to the end of October. In New Brunswick the work was begun on the 19th of May and continued to the end of October.

The same methods were used by both instructors. On the arrival of the boats from the fishing ground each day they visited the landing places and gave instruction in the splitting, washing, and salting of the fish, emphasizing especially the bleeding of the fish when caught. Afterwards they visited the drying places and gave instruction in and supervised the methods of drying. The renewed requests for continuation of such instruction testify to the good work being done by these instructors.

At the Magdalen Islands the following places were systematically visited: Etang du Nord, South Beach, Point Basse, Amherst Harbour, Aurigny, Grindstone, Hospital Cove, Old Harry, Grand Entry, Grosse Isle, Brion Island, Point du Loup, Gros Cap, Cabin Cove, and West Cape.

In Gloucester county, New Brunswick, the following places were visited: Lameque, Island River, Point Alexander, Pigeon Hill, Miscou Harbour, Miscou Centre, Miscou Point, Miscou Plains, Wilson's Point, Landry's Brook, Ste. Cecile, Little Shippegan, and Cape Bateau.

The regular fishery officers of the department in the districts named supervised the work of the instructors.

*Cod Curing in Pickle.*—The work of instruction in cod curing in pickle was continued in Nova Scotia and Prince Edward Island during the fishing season of 1933. It was carried on under the immediate and direct supervision of Mr. George R. Earl, who had four highly qualified assistants working under him who demonstrated the actual splitting and salting of fish and the cutting of it into boneless fish.

The work was greatly extended during 1933, particularly in Nova Scotia east of Halifax. The principal buyers of pickle-cured codfish are in the United States, and these buyers have made it clear that wherever they find that fishermen follow closely the advice and instruction given by our instructors and produce a quality in accordance therewith, they are prepared to very greatly increase their purchases. As might be expected, it is only at places here and there that fishermen are found prepared to follow absolutely the advice and instruction given. It is gratifying, however, to note that a number of new places came under instruction in the past year, especially along the eastern shore of Nova Scotia and in Cape Breton.

Last year in eastern Nova Scotia the following places were under supervision and instruction: Marie Joseph, Liscomb, Port Beckerton, Goldboro, Drum Head, Coddles Harbour, Seal Harbour, New Harbour, and ultimately to a limited extent Canso.

In Cape Breton island supervision and instruction were given in the Petit de Grat district, also at Glace Bay, Alder Point, Little Bras d'Or, and in the Cheticamp district, which includes Cape Rouge, to Grand Etang and Margaree Harbour.

As an example of the results that are being achieved through the instruction thus given, it may be noted that in the course of last season a large cargo of pickle-cured codfish was forwarded to Gloucester by a shipper in Guysboro county. The price talked of before shipment was \$2.70 per hundredweight for large and \$1.80 for medium. On the arrival of the cargo in Gloucester the buyer intimated that the quality was satisfactory in every respect and one of the nicest cargoes of fish that he had ever seen and as a consequence made the price \$3.25 for large and \$2.25 for medium. The buyer further intimated that if all the fish he got could be as good quality as these he felt that he could greatly increase the salt fish business.

The shipper referred to above followed closely the advice and instruction of our instructors.

#### EDUCATIONAL COURSES OF INSTRUCTION

By arrangement with the Biological Board of Canada a short course of instruction was given at the Fisheries Experimental Station at Halifax, Nova Scotia, to managers of lobster canneries on the Atlantic coast by the staff of the board in March, 1933. The course covered a period of nine days. The mornings were devoted to lectures and the afternoons to the practical work of canning lobsters and lobster paste. The subjects covered were biology, physics and chemistry, bacteriology, principles of canning, methods of lobster canning, equipment of canneries, grading of canneries, spoilage and inspection of canned lobsters, by-products, canning practice, explanation of Meat and Canned Foods Act.

In the beginning of the year 1934 another course of instruction was given to fishermen on the Atlantic coast. The instruction in this case also was given at the Fisheries Experimental Station at Halifax, by the staff of the Biological Board assisted by Mr. Robert Gray and Mr. George R. Earl, officers of the department. Owing to curtailment of the funds made available to the Biological Board the length of this course was cut down to one month in place of six weeks as in other years.

The number of applications for admission to these courses is far in excess of the accommodation available. Twenty-five applicants were accepted as meeting the requirements but only nineteen found themselves able to attend the course.

The instruction covered the preparation and packing of pickled fish and of barrel making, preparation of pickle cured and boneless cod, motor engines, elementary science bearing on fish, fish life and the preservation of fish, and first aid and gardening as an adjunct to fishing. Instruction in navigation was also given in the evenings to those who cared to attend. The attendance at the navigation classes was almost one hundred per cent.

At the Fisheries Experimental Station at Prince Rupert, British Columbia, the board's staff inaugurated a means of giving instruction of a scientific nature bearing on fish and fisheries to fishermen. It took the form of lectures which were started in the beginning of the year, 1934, by Doctor Bedford, of the Biological Board's staff at Prince Rupert. The series, two in number, were given to the vessel owners' association and the Fishermen's Union of Prince Rupert. The lectures dealt specifically with the preservation of halibut at sea but the principles laid down can be just as well applied to the preservation of other sea fish which have to be stored on board a vessel for a number of days. The lectures afterwards were published by trade journals and were evidently very highly appreciated by those who heard and read them.



## APPENDIX No. 6

### REPORT ON OYSTER CULTURAL WORK BY THE DEPARTMENT OF FISHERIES, 1933-34

BY DR. A. W. H. NEEDLER, BIOLOGICAL BOARD OF CANADA

The Dominion Government, by an agreement with the province of Prince Edward Island in 1928, obtained jurisdiction over the oyster areas of the province and undertook to develop its oyster industry. As the most important step in that direction the establishment of oyster farming was planned in those suitable areas which did not support a valuable public fishery. The most important of these was the Malpeque Bay area which once supported the largest fishery in the province but in which the oyster stocks had been reduced to a low level by intensive fishing and then almost completely obliterated by a disease in the years following 1914. Operations were concentrated in this area which has similar conditions to those in other areas along the north shore of the province.

The presence of oysters in small but increasing quantities at the heads of the inlets tributary to Malpeque bay had indicated that oyster farming might again be feasible in the area. In 1928 and 1929 the area was explored by the department and experimental plots were established on which the success of certain oyster cultural methods was to be demonstrated or determined. The department obtained the services of a practical oyster farmer from New England who applied methods known to him, using as a basis both locally produced seed oysters and oysters transferred from other areas in the province. In 1929 the Biological Board of Canada commenced scientific investigations relative to oyster culture making its headquarters on Bideford river—one of the inlets tributary to Malpeque bay. In 1930 the experimental work of the department was placed under the supervision of the writer, who was in charge of the board's oyster investigations.

It was found that oysters introduced from other areas died in about a year with symptoms similar to those of the disease of 1914-16, while local oysters were unaffected, being apparently resistant. To prevent further damage by the disease the transfer of oysters to and from the affected area was prohibited and it was necessary to depend on the local stock to establish oyster culture. This was limited largely to the heads of the inlets or "rivers" and to a narrow shore zone, i.e., to places where the greater summer warming of the water favoured reproduction and where wave wash kept the bottom clean. Deeper grounds were practically barren and, in the rivers, badly silted. The dependence of the industry on the very limited local stock emphasized the importance of conserving it for use in establishing oyster farming and of developing the best possible cultural methods. The area was kept closed to public fishing and the experimental farming, now concentrated in Bideford river, was continued.

In 1931, when the results of experimental plots were considered sufficiently promising to warrant encouraging private oyster farming oyster ground in the Malpeque Bay area and in certain other bays having similar conditions was offered for lease. A survey to facilitate the location of the areas had been made in 1929 and 1930. Areas at the heads of the inlets where reproduction is good, but the quality of the oysters poor, were reserved for spat collection by all and the department reserved areas in Bideford river for the continuance of experimental farming. These areas were also used for the production of stock to be sold to lessees to establish oyster culture in their areas.



*Leasing of Oyster Grounds and the Cultivation of Leased Areas.*—A number of applications were received immediately following the offer of oyster ground for lease in October, 1931. Investigation of the applications preceding approval, surveying and marking of the areas and execution of the leases prevented the completion of any leases before 1932. To avoid unnecessary delay of the development of the leased grounds, work was permitted in a number of cases in advance of completion of the leases at the risk of the applicants.

In the Malpeque area, chiefly in Bideford river and its vicinity, cultural operations were commenced in 1932 on 26 areas totalling about 110 acres. As was to be expected most conducted work on only a small experimental scale. However, active interest and an actual start was indicated by the following figures: 254 barrels of small oysters purchased from the department were planted on 14 leases; over 1,200 bushels of shells were exposed in wire bags for the collection of spat, in addition to considerable quantities spread on the bottoms. Labour spent in cleaning the grounds of mussels and silt is difficult to estimate, but exceeded an average of one week per lessee. As a start in the first year when the lessees, new to the work, were making preliminary trials, this is considered creditable.

The degree of success attending the operations in 1932 had a definite bearing on the 1933 developments. The lessees were, on the whole, successful in obtaining spat on the shells which they exposed for that purpose, but serious losses resulted from the failure of any lessees to remove starfish from grounds on which spat was to be planted. This resulted in 1933 in attempts to rear spat to a larger size near the heads of the inlets, where starfish are less numerous, and in mopping for starfish. Small oysters purchased from the department survived well in almost all cases, showing that oysters over one year old are free from serious loss from starfish, and this created a much greater demand for small oysters for stocking purposes, which was met in part by sales by the department, and in larger part by issuing permits to lessees authorizing the picking by hand of oysters in the shore zone where natural mortality is high.

By the beginning of December, 1933, operations had been started on 45 areas in the Malpeque Bay region for 33 of which, amounting to about 140 acres, the leases had been completed. On these areas 153½ barrels of oysters purchased from the department and 440 barrels picked by the lessees were planted. More of each would have been used except for an unusually early freeze-up. Over 800 bushels of shells in wire bags and a larger quantity of shells spread directly on the areas were used for cultch in addition to trials of cardboard collectors, brush, etc. Forty-two barrels of oysters were taken and sold from three of these areas.

Outside the Malpeque Bay region a number of areas have been leased. In Savage bay three leases, comprising about eight acres, have been issued. On these 58 barrels of oysters were planted in 1933 and a great deal of work was done in removing mussels and improvement of the grounds. In Covehead bay six areas, comprising about 33 acres, have been leased on which 370 barrels of oysters were planted in 1933 and much labour spent in removing mussels and spreading shells, and from which 50 barrels of oysters were taken for sale. These two bays are on the north shore of the province, east of Malpeque bay. General conditions in them are similar to those in Malpeque bay, but they were not reached by the disease of 1914-1916 so that it has been possible to utilize stock from the Charlottetown areas to establish oyster culture in them. Foxley river is tributary to Cascumpeque bay in which conditions are closely similar to those in Malpeque bay, and to which the disease spread from the latter. In Foxley river two areas, amounting to about eight acres, were leased and operations commenced on them, including the improvement of muddy bottom with sand and the planting of 17 barrels of oysters.

In the three smaller regions, as well as in Malpeque Bay and its tributaries, areas being leased exceed in number those for which the leases have been completed.

The leasing and the development of leased areas are summarized in the accompanying table:—

Region	Year	Number of Areas under Cultivation	Approximate Area of Leases under Cultivation	Oysters Planted	Oysters Taken for Sale	Shell Culch Planted
			acres	bbl.	bbl.	bu.
Malpeque bay.....	1932	27	110 <sup>1</sup>	254	78	over 1,500
	1933	46	195 <sup>1</sup>	593	181	over 1,600
Cascumpeque bay.....	1933	2	8	17	none	none
Covehead and Brackley bays..	1933	6	33	370 <sup>2</sup>	50 <sup>2</sup>	over 300
Savage bay.....	1933	3	8	58	none	over 100
Total in.....	1933	57	244 <sup>1</sup>	1,038	231	over 2,000
Grand total.....	1932-33	57	244 <sup>1</sup>	1,517	309	over 3,500

NOTE.—The Malpeque Bay areas include one area held under a deed made years ago. Holders of this area are carrying on their operations in accordance with the departmental plan.

<sup>1</sup> Not including the acreage of the deeded area.

<sup>2</sup> Not including 300 bbl. planted and reshipped in the same season.

It will be seen that, in all, over 1,200 barrels of oysters have been planted in addition to large quantities of shells with spat or to collect spat, while about 100 barrels have been fished for sale, so that a much higher production is promised in the near future.

*Experimental Farming in the Malpeque Bay Area.*—Experimental farming on areas reserved for that purpose in Bideford river (tributary to Malpeque bay) has had as its aims the development of oyster cultural methods suitable to our conditions, their demonstration to the industry, and the provision of stock for the establishment of oyster farming in other parts of the Malpeque and Cascumpeque Bay districts.

The last purpose—provision of stock to lessees—was served in 1933 by the sale of 153½ barrels of small oysters for planting purposes. A demand existed for more than double that amount and would have been largely satisfied if delivery had not been prevented by an exceptionally early freeze-up. A price of \$2 per barrel was charged, at which the oysters represent a very profitable investment to the purchaser, thus encouraging the stocking of the leased ground and the increase of oyster production.

In 1933, 759½ barrels of oysters were fished on the department's reserved areas, of which 64 barrels were obtained in the shore zone and 695½ barrels on beds previously stocked by the department. Of these 153½ barrels were sold to lessees for planting, as mentioned above, and 326½ barrels were marketed, the total return from all sales being \$1,768.15. The yield and the sale of oysters could have been increased if the freeze-up had not been unusually early. Replantings on the department's areas totalled 265½ barrels. Oysters used in these replantings were obtained largely from the separation of clusters; 170 barrels were small oysters and 95½ barrels large, the shape and quality of which will be improved by planting singly in their new situation.



*Results of Cultivating Experimental Plots.*—The results of experiments in oyster cultural methods are evident only in a consideration of individual trials. Owing to the time required by oysters to reach marketable size—three to five years—the final yield of most of the experiments cannot yet be reported but two examples are available, one of the effects of planting spat collected on shells and one of a trial transfer from the head of the inlet to an area producing high quality.

(a) *Planting of Spat.*—An area of about  $\frac{1}{3}$  of an acre on the “Totten” bed in the department’s reserved area at the head of Bideford river was cleaned by tongers in 1929 and thoroughly mopped for starfish. On it were planted about 400 bushels of shells on which a set of spat had been obtained by exposing them in wire bags and in heaps on shallow shores. In August, 1932, 140 barrels of oysters were taken from half of the area. In 1933 an additional 216 barrels were taken, of which about half were of the original planted spat and the remainder younger. In addition there were left on the bed all the oysters smaller than  $1\frac{1}{2}$  to 2 inches, and an estimated quantity of 50 barrels of larger oysters missed by the tongers (about one barrel per man was obtained on the last day). To summarize:—

1929—Shells with spat planted.....	c.a. 400 bush.
1932—Oysters fished (largely 1929 spat).....	140 bbls.
1933—Oysters fished ( $\frac{1}{3}$ 1929 spat).....	216 “
Estimated left on bed, in addition to many very small oysters	50 “
	<hr/> 406 bbls.

This represents a yield, four years after planting, of over 1,200 barrels per acre, not counting many small oysters left on the bed. This yield was actually too high, i.e., the crowding produced a relatively poor shape. This could have been overcome, however, by separation of clusters in 1931 and planting the singled oysters on a larger area, and the trial demonstrates that a very high production is possible in the district.

(b) *Transfer of Oysters.*—In 1930, 210 barrels of small oysters from the shores at the head of Bideford river were planted on a part of the Cooper bed—a ground further down the inlet which in the past produced oysters of very high quality. In 1933 this plot was fished in an attempt to obtain from it as many marketable oysters as possible. It was found that only half, or slightly less, had reached or passed marketable size and of this half of the population  $120\frac{1}{2}$  barrels were taken. Judging from the daily catches it was estimated that only about three-quarters had been obtained as it becomes less profitable to fish on an area when the oysters become less abundant and tongers cannot therefore obtain all the oysters without persistent effort. It is seen that if all had been obtained about 160 barrels would have been taken and as only half were large enough to remove we are forced to conclude that about 320 barrels of oysters were on the area before fishing commenced. We have, then, over 300 barrels resulting in three years from a planting of 210 barrels. As regards quality, the oysters planted were very poor—thin shells, crooked shape, poor meats. Those obtained in 1933 had excellent meats and thick shells. The smallest (which were presumably quite small when transferred) were of very good shape while those which were larger when transferred were of poorer, but improved, shape. The transfer resulted in a good survival, a slow growth and a great improvement in shape.

*General Development of Oyster Cultural Methods.*—Scientific investigations were directed at first towards a study of the conditions in the area and to the development of spat production. It was found that owing to higher temperatures in them in summer the heads of the inlets only could be expected to give con-



sistent production of spat. At the heads the department has succeeded, in each year from 1929 to 1933, in obtaining good "sets" of spat on suitable clutch—e.g. 2,000 to over 5,000 spat per bushel of shells exposed in wire bags. Methods of spat production are still under investigation with a view to finding improvements, but it is evident that spat can be produced in good paying quantities with fair reliability.

Early trials soon indicated a good survival of oysters after the size of  $1\frac{1}{2}$  to 2 inches had been reached. The most difficult step in oyster culture in the region has been found to be the rearing of spat from the time of their settling to the above size, which is attained about the end of the second summer. It is apparent that destruction by starfish is the chief cause of the serious losses of young oysters. Special effort is being directed towards the development of methods of rearing spat to a relatively safe size out of reach of the starfish. Results have hitherto been encouraging. Shells in wire bags suspended from floats have produced a lower mortality, a better growth and more even distribution of the spat when compared with bags stooked on the bottom. Separated spat reared on floats during their second summer have shown a very much lower mortality and a more rapid growth than spat spread on the bottom and it is believed that, when further developed, this method will be more profitable than the planting of spat directly on beds.

Experiments have also been carried on in the improvement of soft bottoms and satisfactory results have been obtained in the hardening of soft mud with sand. Other lines of investigation include improvement of forms of cultch, study of the effects of separation and transfer on shape and growth, and a great many minor subjects.

#### OYSTER INVESTIGATIONS AT SHEDIAC IN 1933

The investigations at Shediac in 1933 included three chief items—experimental transplantation of oysters from the upper Richibucto river, further trials in spat collection, and survey of the existing populations to define a reserve.

*Transfer of Oysters from the Richibucto River.*—One hundred and thirteen barrels of oysters from the upper Richibucto river were transferred early in June to a bed cleaned for that purpose in Shediac bay. Taken from waters of low salinity, where the quality was too poor for the market, and planted on an area of high salinity, a considerable mortality resulted but the surviving oysters grew and had commenced to improve in shape before the end of the season. It is indicated that with modifications this method may be of value in stocking areas in Shediac bay but a greater time in their present situation is necessary to determine the final results of the transfer.

*Collection of Spat.*—Exposure of clean shells in wire baskets at various times and places met with slightly better success than in 1932, but the "set" obtained was very poor. In 1932 it was nil. Observations indicated that it was similarly poor on natural materials, although the oysters spawned thoroughly.

*Choice of a Reserve.*—In 1932, though oysters spawned throughout the area, practically no spat was collected in the trials conducted and little was found on natural objects,—none being found except on one bar. The statistics of the fishery in the past indicate that the catch was early reduced to a low level and that it has since shown erratic and considerable fluctuations, with an irregular production of spat and the occurrence in former years of failure similar to that in 1932. A progressive increase in the yield occurred during the years following 1893 when the Department of Fisheries established a reserve, but when this was no longer operated the catch was again reduced. The beneficial effects of the maintenance of a sufficient spawning stock over periods of poor spat production were

evident. Without such a reserve the failures in spat production make the area particularly susceptible to depletion, and one was established in 1933.

In 1933 experimental tonging indicated a larger population and a higher proportion of small sizes than was expected from the 1932 results. This was due, in part at least, to a slower growth than was expected and to consequent failure of the smaller sizes to grow to marketable size and be fished. The survey confirmed the lack of oysters spawned in 1931, 1932 and 1933 and the consequent probable fall of the catch in the near future. The need for a reserve is again emphasized, and an area (bar off Indian Island) was selected for this purpose as being close to the chief centre of production and having a high proportion of small oysters thus causing little immediate hardship to fishermen in reserving it.

*Public Health Survey.*—A survey by the Department of Pensions and National Health indicated the presence of a degree of pollution sufficient to necessitate further investigation.

*Scientific Investigation by the Biological Board.*—Work designed to throw light on the factors causing failures in spat production, and the general conditions of the area, was interrupted at the beginning of the most important season by the sudden illness of the investigator employed in it.

## APPENDIX No. 7

### SCALLOP INVESTIGATIONS IN 1933

REPORT BY CHAS. BRUCE, A.M.E.I.C., FISHERIES ENGINEER

In view of strong representations to the department that, while previous exploratory work for the location of scallop beds around Isle Madame in Richmond county, N.S., had not located beds of commercial importance, the petitioners believed such areas to exist, further work was done during the year.

While in some areas good bottom for scallops was found, in a total of 34,050 yards of dragging only 192 live scallops were taken, not sufficient to be of any value to commercial fishing.

Early in the season reports reached the department that fishermen, who had equipped for fishing scallops off the north and east coasts of Prince Edward Island, where exploratory work in 1932 had resulted in the location of some large and promising beds, were unable to locate these scallops. In response to the request that aid be given, the scallop dredge, *A. Halkett*, went over this ground again during the season and as a result of investigations it was discovered that where scallops could be taken in good quantities the previous year, they had apparently been attacked by disease. In many instances as many as 75 per cent of the scallops taken in the drags were dead. This condition was referred to the Biological Board and, while probably no remedial measures are feasible, the board is investigating to determine, if possible, the cause of the heavy mortality.

In 1932 scallop beds of distinct importance were located off the coast of Charlotte county, N.B., and full advantage was taken of this by the local fishermen during the autumn and winter following. In some instances the beds were not very large and as the fishing was rather intensive, some of them were soon depleted. As this fishery has proved a lucrative one to those engaged in it, the department acceded to the request that it do further exploratory work in the hope that other beds might be located.

The coast around Grand Manan Island, and the mainland as far east as Chance harbour, St. John county, was explored at likely places, a total of 65,500 yards being dragged. Two beds which gave promise of containing scallops in paying quantities were located, one in St. Andrews bay, between Fairhaven and St. Andrews island, where 503 scallops were taken in 9,400 yards of dragging, and another outside Spruce island, West Isles.

After the season opened in the autumn, it was reported that boats had obtained twenty gallons of scallops in five hours' dragging on the St. Andrews Bay bed.

The season was late for a complete investigation of the Spruce Island area, but the pilot, a local fisherman, was satisfied from the prospects that it contained scallops in commercial quantities.

East of Wolf island a bed was located which it was considered offered a fair prospect of providing commercial fishing.



# APPENDIX No. 8

## SUMMARY OF EXPENDITURE AND REVENUE BY PROVINCES, IN THE FISHERIES SERVICE 1867-1933-34, UNDER THE DOMINION GOVERNMENT, AND FINANCIAL STATEMENT OF THE DEPARTMENT OF FISHERIES FOR 1933-34.

	Expenditure	Revenue
	\$ cts.	\$ cts.
Nova Scotia.....	6,115,044 99	397,242 66
Prince Edward Island.....	993,108 08	115,906 44
New Brunswick.....	4,400,582 36	617,618 69
Quebec.....	2,434,386 53	341,486 12
Ontario.....	3,217,202 56	520,216 96
Manitoba and Northwest Territories.....	23,414 29	4,779 25
Manitoba.....	1,763,968 84	334,589 81
North West Territories.....	58,258 58	9,775 23
Alberta.....	518,261 96	226,736 41
Saskatchewan.....	575,983 42	101,945 16
British Columbia.....	14,075 619 25	2,769,063 93
Yukon.....	29,343 94	13,092 75
Hudson Bay District.....		821 83
	34,205,174 80	5,453,275 24
Cruisers, N.S., P.E.I., N.B.....	5,633,743 92	
Expenditure, general.....	5,097,832 64	
Fishing bounty.....	8,228,362 61	
	53,165,113 97	

## FINANCIAL STATEMENT, 1933-34

Vote No.	Appropriations	Amount	Expenditure
160	(Salaries and disbursements of fishery officers and guardians.. Fisheries Patrol Service..... Fisheries Protection Service.....)	1,022,000 00	423,729 53 233,998 68 180,563 91
161	Building fishways and clearing rivers.....	18,000 00	838,292 12
162	Legal and incidental expenses.....	6,000 00	1,371 95
163, 396	Conservation and development of the deep-sea fisheries, etc....	85,000 00	3,850 80
164	Fish culture.....	300,000 00	54,191 84
165	Oyster culture.....	13,000 00	205,682 84
166	Bounty on hair seals.....	40,000 00	8,909 08
167	International Fisheries Commission (Halibut).....	4,567 50	174,823 80
168	Biological Board of Canada.....	29,500 00	24,902 89
169	Grant to United Maritime fishermen.....	175,000 00	174,823 80
170	Investigation <i>re</i> Passamaquoddy and Cobscook bays.....	4,500 00	4,050 00
		3,000 00	2,451 07
17	Civil Government salaries.....	1,696,000 00	1,323,093 89
17	Civil Government contingencies.....	111,456 00	100,252 08
Statutory	Fishing bounty.....	30,000 00	11,015 20
		160,000 00	159,311 35
Statutory	Salary Deduction Act, 1933.....	1,997,456 00	1,593,672 52
Statutory	Miscellaneous gratuities.....		2,060 96
			720 00
	ASSETS—"Special Account United States Government <i>re</i> Pacific Halibut Treaty".....		1,596,453 48
	(Being balance due Canada on divisible expenses at the close of the fiscal year 1933-34, by the United States Government).		• 3,113 84
			1,599,567 32

STATEMENT OF REVENUE RECEIVED DURING THE FISCAL YEAR 1933-34

Class	Total	General Account	Nova Scotia	Prince Edward Island	New Brunswick	Quebec	Ontario	Alberta	British Columbia	Yukon
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Fisheries revenue.....	39,524 33		9,248 50	1,640 33	9,828 25		4 00		18,293 25	510 00
Fines and Forfeitures.....	12,625 77		4,423 90	330 29	582 95				7,238 63	30 00
Modus vivendi.....	247 00		100 00						147 00	
Casual revenue.....	26,039 22	22,328 32	510 86	2,054 66	34 80	15 30	60 00	224 08	811 20	
Fish culture revenue.....	1,677 54				1,460 54				217 00	
Pelagic sealing revenue.....	52,466 26	52,466 26								
Premiums, etc.....	17 44	17 21	0 04						0 19	
	132,597 56	74,811 79	14,283 30	4,045 28	11,096 54	15 30	64 00	224 08	26,707 27	540 00
Refund of fees received prior to 1933-34.....	15 92									
	132,581 64									

EXPENDITURE 1933-34—SUMMARY OF SALARIES AND DISBURSEMENTS OF FISHERIES OFFICERS

	Totals	Personal Services	Supplies and Materials	Travel Expenses	Communication Services	Transportation of Things	Advertising and Publicity	Grants Subs. Contrs.	Prof. and Special Services	Rents	Miscellaneous Current Expenses
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Nova Scotia.....	156,051 80	114,827 76	3,089 89	31,060 51	6,119 00	482 31			43 10		429 23
Prince Edward Island.....	25,343 39	16,669 80	1,627 10	5,946 00	859 30	103 59	11 85		55 30		70 45
New Brunswick.....	104,017 17	76,707 66	2,052 80	22,268 86	2,241 84	194 11	3 60	24 00	405 45		118 85
Quebec.....	446 68			309 68							137 00
British Columbia.....	137,870 49	92,488 44	8,014 29	29,208 19	6,156 91	768 38			28 90	443 61	761 77
	423,729 53	300,693 66	14,784 08	88,793 24	15,377 05	1,548 39	1 545	24 00	532 75	443 61	1,517 30

## FISHERIES PATROL SERVICE—EXPENDITURE 1933-34 AND SUMMARY

NOVA SCOTIA—	
<i>District No. 2—</i>	
Departmental boats.....	\$ 11,180 18
<i>District No. 3—</i>	
Departmental Boats.....	13,038 50
	<hr/>
PRINCE EDWARD ISLAND—	\$ 24,218 68
Departmental Boats.....	1,726 44
Chartered boats.....	2,241 28
	<hr/>
	3,967 72
NEW BRUNSWICK—	
<i>District No. 1—</i>	
Departmental Boats.....	9,528 75
<i>District No. 2—</i>	
Departmental Boats.....	1,596 64
Chartered Boats.....	15,280 35
New Boats.....	27,740 25
	<hr/>
	54,145 99
BRITISH COLUMBIA—	
General.....	5,118 75
Digby Island.....	4,222 03
Poplar Island.....	1,963 46
Air Patrol.....	17,896 63
<i>District No. 1—</i>	
Departmental Boats.....	17,720 52
Chartered Boats.....	3,235 68
General.....	84 06
<i>District No. 2—</i>	
Departmental Boats.....	33,734 98
Chartered Boats.....	25,910 72
General.....	722 33
<i>District No. 3—</i>	
Departmental Boats.....	18,654 35
Chartered Boats.....	22,376 13
General.....	26 65
	<hr/>
	151,666 29
	<hr/>
	\$ 233,998 68
	<hr/>

## SUMMARY

Nova Scotia.....	\$ 24,218 68
Prince Edward Island.....	3,967 72
New Brunswick.....	54,145 99
British Columbia.....	151,666 29
	<hr/>
	\$ 233,998 68
	<hr/>

## FISHERIES PROTECTION SERVICE—SUMMARY FOR 1933-34

East coast.....	81,282 72
West coast.....	99,281 19
	<hr/>
	\$ 180,563 91
	<hr/>



## DETAILED STATEMENT OF FISH CULTURE, 1933-34

Hatcheries	Personal Services	Other Outlay	Totals by Hatcheries	Totals by Provinces
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>Nova Scotia</i> .....				51,766 24
Antigonish.....	5,922 00	6,850 77	12,772 77	
Bedford.....	4,672 10	4,401 05	9,073 15	
Lindloff.....	646 80	913 89	1,560 69	
Margaree.....	4,825 65	1,804 96	6,630 61	
Margaree Pond.....	1,768 89	1,452 39	3,221 28	
Middleton.....	3,933 33	2,477 35	6,410 68	
Nictaux Pond.....	642 15	692 58	1,334 73	
Phillips River Pond.....	1,126 98	487 86	1,614 84	
Sackville River Pond.....	431 86	50 23	482 09	
Yarmouth.....	4,615 48	4,049 92	8,665 40	
<i>Prince Edward Island</i> .....				5,151 68
Kellys Pond Hatchery.....	3,259 05	1,146 47	4,405 52	
Morrell River Pond.....	555 99	190 17	746 16	
<i>New Brunswick</i> .....				44,882 12
Florenceville.....	4,101 30	2,031 33	6,132 63	
Grand Falls.....	3,124 62	2,909 89	6,034 51	
Miramichi.....	4,154 10	1,774 46	5,928 56	
Miramichi Pond.....	631 80	403 21	1,035 01	
New Mills Pond.....	1,753 81	1,745 77	3,499 58	
Nipisiquit.....	381 82	67 64	449 46	
Restigouche.....	2,939 10	767 53	3,706 63	
St. John.....	6,451 08	4,066 97	10,518 05	
St. John Pond.....	2,205 05	5,100 46	7,305 51	
Tobique.....	62 13	210 05	272 18	
<i>General Account</i> .....				1,584 12
General Account—East.....	15 12	1,061 82	1,076 94	
General Account (Chamcook Lake, N.B.).....	81 00	101 44	182 44	
General Account (Grand Lake, N.S.).....	171 45	153 29	324 74	
<i>Supervisor, Engineers and Staff</i> .....	4,590 00	1,922 99	6,512 99	6,512 99
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>British Columbia</i> .....				95,785 69
General Account.....	25 20	923 29	948 49	
General Account (Beaver Lake).....	686 81	452 51	1,139 32	
General Account (Charlie Lake).....		9 33	9 33	
General Account (Cranbrook) See below.....				
General Account (Fish Lake).....	311 11	215 28	526 39	
General Account (Turunculosis Inv.).....		303 33	303 33	
General Account (Gerrard).....	57 30	3 92	61 22	
General Account (Nanaimo Inv.).....	11 02	72 55	83 57	
General Account (Qualicum Pond).....	62 10	32 27	94 37	
General Account (Tiehl McClinton).....	531 07	463 78	994 85	
General Account (Stuart).....	22 50	136 34	158 84	
Supervisor, Engineers and Staff.....	7,398 00	506 74	7,904 74	
Anderson.....	4,682 30	961 23	5,643 53	
Babine.....	4,868 08	2,114 51	6,982 59	
Cowichan.....	4,972 79	2,532 61	7,505 40	
Cranbrook—				
General Account.....	2,206 64			
Cranbrook.....	15 40			
	1 00	2,221 04	2,222 04	
Cultus.....	7,889 98	3,118 88	11,008 86	
Kennedy.....	5,278 73	838 76	6,117 49	
Lakelse (Skeena).....	8,699 24	2,785 15	11,484 39	
Lardeau.....	109 36	64 48	173 84	
Lloyds Creek.....	1,478 14	618 82	2,096 96	
Nelson.....	4,200 50	983 70	5,184 20	
Pemberton.....	6,440 07	1,331 32	7,771 39	
Penask.....	773 46	597 52	1,370 98	
Pitt.....	3,978 29	592 29	4,570 58	
Rivers Inlet.....	9,115 89	2,058 01	11,173 90	
Summerland.....	97 72	157 37	255 09	
<i>Fish Culture—Total</i> .....				205,682 84

## SUMMARY

Provinces	Personal Services	Other Outlay	Totals by Provinces	Grand Total
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Nova Scotia.....	28,585 24	23,181 00	51,766 24	
Prince Edward Island.....	3,815 04	1,336 64	5,151 68	
New Brunswick.....	25,804 81	19,077 31	44,882 12	
General Account—East.....	267 57	1,316 55	1,584 12	
Supervisor, Engineer and Staff—East.....	4,590 00	1,922 99	6,512 99	
British Columbia.....	71,690 66	24,095 03	95,785 69	
	134,753 32	70,929 52	.....	205,682 84

DETAILED STATEMENT OF CONSERVATION AND DEVELOPMENT OF THE  
DEEP-SEA FISHERIES—EXPENDITURE, 1933-34

General Account.....		2,659 27	
Lobster Collection Service, Nova Scotia—			
"Nova II".....	6,273 28		
"Nova IV".....	6,734 11		
"Dominion Halsyd".....	4,013 71		
"Ile Madame".....	448 09		
Allowance for supervision.....	400 00		
		17,869 19	
Packet Service—L'Ardoise, N.S.....		1,500 00	
Grants to Exhibitions, N.S.....		1,800 00	
Bait Freezers—			
Canso, N.S.....	179 16		
Chéticamp, N.S.....	17 50		
		196 66	
Bait Collection Service, N.S.....		715 50	
Grant to "Canadian Fishermen".....		1,500 00	
Educational work.....		11,094 17	
Exhibitions.....		5,862 28	
Aids in expanding demands for fish—			
Cooking demonstration.....	5,410 23		
General.....	5,584 54		
		10,994 77	
			\$ 54,191 84

MARINE BIOLOGICAL BOARD—STATEMENT OF EXPENDITURE, 1933-34

<i>St. Andrews Biological Station</i> .....	46,166 05		
Atlantic salmon investigation.....	694 07		
Cultural investigation.....	213 90		
General lakes survey.....	137 93		
Lobster investigation.....	14 97		
Marine food fishes.....	1,035 91		
Oyster investigation.....	857 34		
		49,120 17	
<i>Nanaimo Biological Station</i> .....	44,197 89		
Chemical investigation.....	702 29		
Pacific salmon investigation.....	6,343 22		
Pacific trout investigation.....	446 43		
Pilchard and herring investigation.....	299 44		
Pink and Chum investigation.....	1,829 38		
Shellfish investigation.....	807 13		
Summer investigation.....	426 35		
		55,052 13	
<i>Halifax Experimental Station</i> .....	31,344 06		
Demonstration building.....	2,015 47		
Eastern passage laboratory.....	156 70		
Short courses.....	1,623 10		
		35,139 33	
<i>Prince Rupert Experimental Station</i> .....	28,654 58		
Investigations.....	1,099 63		
		29,754 21	
<i>General Account</i> .....		7,999 01	
			\$ 177,064 85

(\*) \$6.34 Fund from previous year carried forward by Board.

St. Andrews Station.....	815 40	
Nanaimo Station.....	1,286 11	
Halifax Station.....	64 97	
General Account.....	68 23	
		<u>2,234 71</u>

[illegible]



## APPENDIX No. 9

### LICENCES ISSUED

Following is a statement of the different kinds of licences issued by the different supervisors during the 1933-34 season:—

#### MAGDALEN ISLANDS, QUEBEC—SUPERVISOR S. T. GALLANT

Kind of Licences	Number of Licences Issued
Lobster fishing licences.....	600 (1 cancelled)
Permits to can lobsters.....	11
Certificates under section 53—5.	
Herring seine licences.....	20
Herring trap-net licences.....	23 (6 cod trap-nets)
Smelt gill-net licences.....	306
Smelt bag-net licences.....	2
	962 (1 cancelled)

#### PRINCE EDWARD ISLAND—SUPERVISOR S. T. GALLANT

Lobster fishing licences.....	2,624 (18 cancelled)
Permits to can lobsters.....	91
Oyster fishery licences.....	241
Quahaug fishery licences.....	51
Certificates under section 53—4.	
Lobster pound licences.....	1
Trap-net fishing licences.....	Nil
Salmon trap-net or pound-net licences.....	6
Set salmon gill-net licences.....	10
Scallop fishery licences.....	Nil
Smelt gill-net licences.....	123
Smelt bag-net licences.....	171
Leases of Oyster privileges—48.	
	3,318 (18 cancelled)

#### NOVA SCOTIA—DISTRICT No. 1—SUPERVISOR A. G. McLEOD

Lobster fishing licences.....	3,055
Permits to Can lobsters.....	32
Oyster fishery licences.....	185
Certificates under section 53—55.	
Trap-net fishing licences.....	32
Salmon drift-net licences.....	Nil
Salmon trap-net, pound-net or weir licences.....	270
Special angling permits.....	128 (2 complimentary)
Set salmon gill-net licences.....	39
Gaspereau weir licences.....	6
Smelt bag-net licences.....	31
Smelt gill-net licences.....	140
	3,918 (2 complimentary)

#### NOVA SCOTIA—DISTRICT No. 2—SUPERVISOR E. D. FRASER

Lobster fishing licences.....	4,287
Permits to can lobsters.....	56
Oyster fishery licences.....	227
Quahaug fishery licences.....	Nil
Shad gill-net or drift-net licences.....	8
Certificates under section 53—88.	
Licence to a captain of a Canadian fishing vessel (using an Otter or other trawl)	4
Lobster pound licences.....	7
Seine licences.....	109
Herring weir licences.....	42
Trap-net fishing licences.....	79
Salmon drift-net licences.....	58
Salmon trap-net, pound-net or weir licences.....	192 (1 cancelled)
Special angling permits.....	104 (1 complimentary)
Set salmon gill-net licences.....	417
Scallop fishery licences.....	Nil
Smelt bag-net licences.....	199
Smelt gill-net licences.....	454
Lobster pound certificates—293.	
	6,243 (1 cancelled and 1 complimentary)

## NOVA SCOTIA—DISTRICT No. 3—SUPERVISOR H. H. MARSHALL

Kind of Licences	Number of Licences Issued
Lobster fishing licences.....	3,196
Permits to can lobsters.....	Nil
Shad gill-net or drift-net licences.....	1
Certificates under section 53—132.	
Lobster pound licences.....	7
Herring weir licences.....	43
Trap-net fishing licences.....	152
Salmon drift-net licences.....	2
Salmon trap-net, pound-net or weir licences.....	51
Salmon net permits (Medway river).....	31
Special angling permits.....	385 (2 cancelled)
Set salmon gill-net licences.....	499
Scallop fishery licences.....	97 (1 cancelled)
Smelt bag-net licences.....	27 (1 cancelled)
Smelt gill-net licences.....	51
Lobster pound certificates—534 (1 cancelled).	
	<hr/> 4,542 (4 cancelled)

## NEW BRUNSWICK—DISTRICT No. 1—SUPERVISOR J. F. CALDER

Lobster fishing licences.....	371
Shad gill-net or drift-net licences.....	47
Certificates under section 53—3	
Lobster pound licences.....	6
Herring Seine licences.....	1
Herring weir licences.....	464 (1 cancelled)
Clam permits.....	114 (2 cancelled)
Salmon gill-net or drift-net licences.....	113
Scallop fishery licences.....	79 (1 cancelled)
Smelt gill-net licences.....	Nil
Smelt bag-net licences.....	Nil
Lobster pound certificates—459	
Lease of Dark Harbour fishing privileges—1.	
	<hr/> 1,195 (4 cancelled)

## NEW BRUNSWICK—DISTRICT No. 2—SUPERVISOR A. L. BARRY

Lobster fishing licences.....	3,234
Permits to can lobsters.....	108 (5 cancelled)
Quahaug fishery licences.....	37
Shad fill-net or drift-net licences.....	Nil
Oyster fishery licences.....	842
Certificates under Section 53—303.	
Lobster pound licences.....	4
a Herring trap-net licences.....	1
Gaspereau pound-net or trap-net licences.....	80
Salmon gill-net or drift-net licences.....	192
Salmon trap-net, pound-net or weir licences.....	388 (1 cancelled)
Bass fishery licences.....	9
Smelt gill-net licences.....	236
Smelt bag-net licences.....	5,558
Lobster pound certificates—296	
	<hr/> 10,689 (6 cancelled)

a Issued on herring weir licence form.

## NEW BRUNSWICK—DISTRICT No. 3—SUPERVISOR L. H. PARKS

Shad gill-net or drift-net licences.....	210 (1 cancelled)
Sturgeon fishery licences.....	Nil
Whitefish fishery licences.....	8
Salmon net permits.....	156
Gaspereau pound net or trap-net licences.....	1
Salmon gill-net or drift-net licences.....	185 (1 cancelled)
Salmon trap-net, pound-net or weir licences.....	104
Bass fishery licences.....	53
	<hr/> 717 (2 cancelled)

## HUDSON BAY AND JAMES BAY

Gill-net permits.....	4
Permit (issued for scientific purposes).....	1
Special angling permits.....	Nil
	<hr/> 5

## PROVINCE OF BRITISH COLUMBIA—CHIEF SUPERVISOR J. A. MOTHERWELL

Kind of Licences	Number of Licences Issued
Small dragger licences.....	28 (1 cancelled)
Special angling permits.....	1,041 (5 cancelled)
Abalone fishery licences.....	4
Indian permits.....	1,934 (2 cancelled)
Crab fishery licences.....	104
Smelt or sardine fishery licences.....	49 (1 cancelled)
Miscellaneous licences.....	96 (1 cancelled)
Salmon fishery licences.....	5,075 (34 cancelled)
Salmon trolling licences.....	2,815 (16 cancelled)
Salmon trap-net licences.....	8
Salmon purse-seine licences.....	238 (1 cancelled)
Salmon drag-seine licences.....	31 (1 cancelled)
Licence to a Captain of salmon purse seine Boat.....	115 (8 drag-seines)
Grayfish fishery licences.....	74
Licence to assistant operators of salmon (purse or drag) seines.....	1,467 (19 cancelled)
Licence to assistant in a boat used in operating a salmon gill-net or drift-net...	1,217 (12 cancelled)
Cod fishery licences.....	353 (18 cancelled)
Whaling licences.....	4
Licence to a captain of a Canadian Halibut fishing boat to operate a herring or Pilchard purse-seine or gill-net for obtaining bait for halibut fishing only, for use on boat mentioned in this licence.....	4
Herring gill-net or drift-net licences.....	21 (1 cancelled)
Herring purse-seine licences.....	40 (2 drag-seines)
Pilchard purse-seine licences.....	28
Licence to a captain of a herring purse seine boat.....	20
Licence to a captain of a pilchard purse seine boat.....	25
Licence to assistant operator of herring purse seine.....	474
Licence to assistant operator of pilchard purse seines.....	177
Herring pound permits.....	15
Pelagic sealing certificates—12.	
	<hr/> 15,457 (112 cancelled)

## YUKON TERRITORY

Special fishery licences.....	32
-------------------------------	----

## PACIFIC COAST

Licences to United States halibut fishing vessels.....	215
--	-----

## ATLANTIC COAST

Licences to United States fishing vessels.....	87 (8 cancelled)
--	------------------

## NORTH WEST TERRITORIES

Reduction works licences.....	4
Walrus licences.....	28
	<hr/> 47,412 (156 cancelled) (3 complimentary)



# APPENDIX No. 10

## COMPARATIVE STATEMENT OF LOBSTER FISHING LICENCES FROM 1928

### PRINCE EDWARD ISLAND AND MAGDALEN ISLANDS

Year	Magdalen Island	Prince County	Kings County	Queens County	Kings and Queens (Southern portion)	Totals
1928.....	682	925	616	337	.....	2,560
1929.....	659	857	509	271	.....	2,296
1930.....	644	922	573	285	.....	2,424
1931.....	526	894	521	283	.....	2,224
1932.....	526	1,409	308	402	398	3,043
1933.....	599	1,359	324	438	485	2,606

### NOVA SCOTIA—DISTRICT No. 1

Year	Inverness County	Richmond County	Cape Breton County	Victoria County	Totals
1928.....	537	648	462	376	2,023
1929.....	501	636	435	329	1,901
1930.....	496	682	442	343	1,963
1931.....	473	745	458	367	2,043
1932.....	542	897	578	426	2,443
1933.....	656	1,092	773	534	3,055

### NOVA SCOTIA—DISTRICT No. 2

Year	Halifax Office	Halifax County	Patrol Boat Thresher	Guys- boro County	Antig- onish County	<sup>a</sup> Pictou and Col- chester	<sup>a</sup> Cum- berland County	<sup>b</sup> Col- chester and Cum- berland County	Totals
1928....	183	976	41	1,021	334	521	171	17	3,264
1929....	153	767	435	1,047	283	358	221	7	3,271
1930....	131	1,135	204	1,087	308	349	255	9	3,478
1931....	142	1,200	170	1,139	273	352	299	15	3,590
1932....	105	1,364	14	1,330	339	462	399	14	*4,029
1933....	68	1,453	59	1,439	350	526	374	18	4,287

<sup>a</sup> Northumberland Straits side.

<sup>b</sup> Bay of Fundy side.

\* The 1932 total includes two licences issued by the District Supervisor.

## NOVA SCOTIA—DISTRICT No. 3

Year	Lunen- burg	Queens	Shel- burne	Yar- mouth	Digby	Kings	Anna- polis	Total
1928.....	563	329	966	827	470	25	119	3,299
1929.....	472	217	850	792	463	27	120	2,941
1930.....	504	250	854	768	483	28	135	3,022
1931.....	590	296	1,016	770	430	.....	128	3,230
1932.....	491	290	965	673	312	.....	148	2,879
1933.....	525	262	1,112	720	415	21	141	3,196

## NEW BRUNSWICK—DISTRICT No. 1

Year	Charlotte	Saint John	Albert and West- morland	Total
1928.....	433	86	1	520
1929.....	360	53	1	414
1930.....	288	57	2	347
1931.....	281	45	4	330
1932.....	380	101	2	483
1933.....	271	99	1	371

## NEW BRUNSWICK—DISTRICT No. 2

Year	Northum- berland County	Resti- gouche County	Gloucester County	Kent County	West moreland County	Totals
1928.....	297	50	517	501	249	*1,981
1929.....	289	43	406	583	188	*1,834
1930.....	319	46	794	638	327	2,124
1931.....	300	54	647	765	326	2,192
1932.....	394	67	933	997	435	2,826
1933.....	407	77	1,041	989	720	3,234

\* The 1928 total includes 367 licences issued by the District Supervisor and the 1929 total 325 licences so issued.

NOTE.—Cancelled licences are not included in the figures in this appendix.

APPENDIX No. 11

RETURN SHOWING DETAILS OF PROSECUTION FOR OFFENCES AGAINST THE FISHERIES ACT, DURING THE FISCAL YEAR 1933-34

NOVA SCOTIA—DISTRICT No. 1—SUPERVISOR A. G. McLEOD

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	Peter LeLacheur.....	Having 1 berried lobster in possession.....	Port Hawkesbury.....	\$5 fine and costs of \$2.85.
2	John King.....	Violation of Sec. 11 of Lobster Fishery Regulations.....	Waters of Strait of Canso, Port Hawkesbury.....	Fined \$25 and costs of \$2.25, or 6 months in jail.
3	Thomas Butts.....	Violation Sec. 23, S.S. 9, Fisheries Regulations.....	Glace Bay lake.....	Fined \$10 and costs of \$2.85.
4	Frederick Lloyd.....	Fishing for salmon in violation of sub-sec. 7, Sec. 28 of Fishery Regulations.....	Framboise.....	Fined \$1 and costs of \$3.80.
5	Arthur MacLeod.....	Violation s.s. 7 of Sec. 28 of Sal. Fishery Regulations.....	Framboise river.....	Fined \$1 and costs of \$3.85.
6	Emil Went.....	Fishing for smelts with gill-net without a licence.....	Lingan bay, C.B.....	Fined \$5 and costs of \$2.85.
7	Archie MacLeod.....	Violation Sub-sec. 7 of Sec. 28 of Sal. Fishery Regs.....	Framboise river.....	Fined \$1 and costs of \$2.25.

NOVA SCOTIA—DISTRICT No. 2—SUPERVISOR E. D. FRASER

1	John McKay.....	Left shore to set lobster gear before 6 o'clock.....	Caribou river, Pictou Co.....	Fined \$5.
2	Murdock McKay.....	Left shore to set lobster gear before 6 o'clock.....	Caribou river, Pictou Co.....	Fined \$5.
3	Jules Fasquel.....	Slink salmon in possession.....	Barneys river, Pictou Co.....	Fined \$2 and costs, \$2.50; 3 salmon confiscated.
4	Russell White.....	Berried lobsters in possession.....	Purcells cove, Halifax co.....	Fined \$100 and costs, \$4.85, or 1 month in gaol; served gaol sentence; 13 berried lobsters confiscated.
5	Samuel Jamieson.....	Berried lobsters in possession.....	Cape Cliff, Cumberland co.....	Fined \$15 and costs, \$1; 13 berried lobsters confiscated and liberated.
6	K. Alex. Pace.....	Fishing lobsters without licence.....	Ecum Secum bridge, Halifax co.....	Fined \$5 and costs, \$2.50.
7	Norman Fleet.....	Fishing lobsters without licence.....	Ecum Secum bridge, Halifax co.....	Fined \$5 and costs, \$2.50.
8	Charles Turple.....	Berried lobsters in possession.....	Pictou island.....	Fined \$20 and costs, \$8.50; 6 berried lobsters confiscated and liberated.
9	Martin David.....	Berried lobsters in possession.....	Port Felix, Guysborough co.....	Fined \$1 and costs, \$4.70; 2 berried lobsters confiscated and liberated.



10	Hector Delorey.....	Fishing lobsters without licence.....	Port Felix, Guysborough co.....	Fined \$1.
11	Harvey Bingley.....	Lobsters in possession close season.....	Bay View, Pictou co.....	Fined \$5 and costs, \$5.90; 200 pounds of lobsters confiscated and liberated; 3 crates confiscated and destroyed.
12	Russell Clark.....	Lobsters in possession close season.....	Bay View, Pictou co.....	Fined \$5 and costs, \$5.40.
13	Harold Hartling.....	Lobsters in possession close season.....	Bay View, Pictou co.....	Reprimanded and ordered to pay costs, \$3.45.
14	Stephen Gashin.....	Fishing lobsters without licence.....	Port Felix, Guysborough co.....	Fined \$1.
15	Aubrey Heighton.....	Lobsters in possession close season.....	Cape John, Pictou co.....	Fined \$2 and costs, \$3; 35 pounds of lobsters confiscated and liberated.
16	Aleson Robinson.....	Lobsters in possession close season.....	Cape John, Pictou co.....	Fined \$2 and costs, \$3; 4 lobsters confiscated and liberated.
17	Fred A. White.....	Smelts in possession.....	Amherst, Cumberland co.....	Fined \$3 and costs, \$2.
18	Tillman Landry.....	Illegal salmon fishing.....	River Hebert, Cumberland co.....	Fined \$2 and costs, \$2; one salmon net confiscated and destroyed.
19	Albert White.....	Illegal salmon fishing.....	River Hebert, Cumberland co.....	Fined \$2 and costs, \$2.
20	John T. LeBlanc.....	Lobsters in possession close season.....	Pictou.....	Case dismissed; costs, \$5.15 to be paid by Department.
21	Freeman Webber.....	Lobsters in possession close season.....	Halifax.....	Fined \$5 and costs, \$3, or 10 days in gaol; served gaol sentence; 4 bags of lobsters confiscated and liberated.
22	John Gilbert.....	Lobsters in possession close season.....	Halifax.....	Fined \$2 and costs, \$3.
23	Lawrence DeBaie.....	Lobsters in possession close season.....	Halifax.....	Fined \$5 and costs or 10 days in gaol; served gaol sentence.
24	Neil White.....	Salmon in possession close season.....	North river, Colchester co.....	Fined \$50 or 25 days in gaol; served gaol sentence; costs, \$3.10 to be paid by Department; 3 salmon confiscated.
25	James Williams.....	Sawdust pollution.....	Hewstons brook, Pictou co.....	Fined \$20 and costs, \$2.50.
26	T. C. Glennie.....	Sawdust pollution.....	Little river, Cumberland Co.....	Fined \$5 and costs, \$8.95; case appealed by Department and appeal pending at close of fiscal year.

## NOVA SCOTIA—DISTRICT No. 3—SUPERVISOR H. H. MARSHALL

1	Wm. Foster, Jr.....	Violation of Sec. 20, Salmon, ss. 1.....	Cowie's falls, Mersey river.....	Fined \$2 and costs of \$1.75.
2	Augustus McKenna.....	Violation of Sec. 20, Salmon, ss. 1.....	Cowie's falls, Mersey river.....	Fined \$2 and costs of \$1.75.
3	Fred Naas.....	Violation of Sec. 20, Salmon, ss. 1.....	Salter's falls, Medway river.....	Fined \$1 and costs of \$3.70, or 5 days in jail.
4	Gordon Schnare.....	Violation of Sec. 20, Salmon, ss. 1.....	Salter's falls, Medway river.....	Fined \$1 and costs of \$3.50, or 5 days in jail.
5	Ernest McKenna.....	Violation of Sec. 20, Salmon, ss. 1.....	Cowie's falls, Mersey river.....	Fined \$3 and costs of \$3.25 or 8 days in jail.
6	Osburn Croft.....	Violation of Sec. 10, Gaspareau, ss. 4.....	Salmon falls, Medway river.....	Fined \$4 and costs of \$3.50 or 8 days in jail.
7	Russell Wolfe.....	Violation of Sec. 58, R.S., c. 73, S. 75.....	Below Milton dam.....	Case dismissed, costs of \$16.05 to be paid by Department.

## NOVA SCOTIA—DISTRICT No. 3—SUPERVISOR H. H. MARSHALL—Concluded

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
8	John Francis.....	Violation of Sec. 20, Salmon, ss. 1.....	Cowie's falls, Mersey river.....	Fined \$1 and costs of 75c.
9	Bruce Hatt.....	Preparing to set a net above tide waters.....	Fritzie place, Gold river.....	Fined on view, \$2.
10	Freeman Hatt.....	Preparing to set a net above tide waters.....	Fritzie place, Gold river.....	Fined \$2.
11	George Stevens.....	Preparing to set a net above tide waters.....	Fritzie place, Gold river.....	Fined \$2.
12	Cecil Stevens.....	Preparing to set a net above tide waters.....	Fritzie place, Gold river.....	Fined \$2.
13	Harold Langille.....	Fishing for salmon above tide waters.....	Marinus river.....	Fined \$5 and costs of \$4.85.
14	Arthur Lennox.....	Lobsters in possession.....	Yarmouth, N.S.....	Fined \$10 and costs of \$3.75, or 30 days in jail.
15	Clarence Lennox.....	Lobsters in possession.....	Yarmouth, N.S.....	Fined \$10 and costs of \$3.75, or 30 days in jail.
16	Nelson Ryder.....	Lobsters in possession.....	Yarmouth, N.S.....	Fined \$10 and costs of \$3.75, or 30 days in jail.
17	Raymond Bourque.....	Fishing smelts with bag-net in violation of Sec. 40, ss. 10, Spec. Fishery Regulations N.S.....	Tusket river in Bourque's cove.....	Fined \$5 and costs of \$1.50 (magistrate fees).
18	Charles Levy.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Liverpool, N.S.....	Fined \$2 and costs of \$2, or 6 days in jail.
19	Robert McLeod.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	S.W. Port Mouton.....	Fined \$2 and costs of \$2.
20	Stanley MacLeod.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	S.W. Port Mouton.....	Fined \$2.

## NEW BRUNSWICK—DISTRICT No. 1—SUPERVISOR J. F. CALDER

1	James Tidd.....	Fishing for scallops without a licence.....	Grand Manan, N.B.....	\$20 fine imposed which was allowed to stand for future good behaviour.
2	Byron Wilcox.....	Having illegal sized lobsters in possession.....	Wood island, Grand Manan.....	\$10 fine or 30 days in jail; collected \$7.70, —\$2.30 outstanding.
3	Lloyd Young.....	Fishing in Bennett Mill brook while brook was closed to fishing.....	Bennett Mill brook, Albert co., N.B.....	\$10 fine allowed to stand.
4	Mabbery Hooper.....	Fishing for lobsters during the close season.....	Back Bay, Charlotte co.....	Suspended sentence.
5	Wm. F. Hooper.....	Fishing for lobsters during close season.....	Back Bay, Charlotte co.....	Suspended sentence.
6	Emery Guphill.....	Having undersized lobsters in his possession.....	Grand harbour, N.B.....	\$10 fine.
7	Douglas Guphill.....	Having undersized lobsters in his possession.....	Grand harbour, N.B.....	\$10 fine imposed, collected, \$5.00.
8	Charles Foster.....	Having undersized lobsters in his possession.....	Seal cove, N.B.....	\$10 fine allowed to stand.

## NEW BRUNSWICK—DISTRICT No. 2—SUPERVISOR A. L. BARRY

1	Joseph Cormier.....	Retaining undersized oysters.....	Cocagne, N.B.....	Fined \$10.
2	Stewart Fenton.....	Fishing for lobsters without licence.....	Chatham, N.B.....	Fined \$2.
3	Melvin Johnston.....	Fishing for lobsters without licence.....	Chatham.....	Fined \$2.
4	Douglas Johnston.....	Fishing for lobsters without licence.....	Chatham.....	Fined \$2.
5	William Loggie.....	Failure to observe weekly close, salmon fishing.....	Loggieville.....	Fined \$1.
6	Alexander Loggie.....	Drifting inside statutory line.....	Bay du Vin.....	Fined \$5.
7	Sterling Williston.....	Drifting inside statutory line.....	Bay du Vin.....	Fined \$5.
8	Alfred Cormier.....	Drifting for salmon inside statutory line.....	Bay du Vin.....	Fined \$5.
9	Rae Williston.....	Failing to release berried lobsters.....	Covedel.....	Fined \$5.
10	John Blake.....	Failing to observe weekly close period.....	Mont Carmel.....	Fined \$5.
11	Coy Manderson.....	Having illegally caught oysters in possession.....	Miramichi river.....	Fined \$4 or 7 days in jail. Went to jail.
12	Calixte Girouard.....	Fishing for smelts in close season.....	Tracadie.....	Guilty—Suspended sentence.
13	Henry LeBreton.....	Fishing for smelts in close season.....	Tracadie.....	Guilty—Suspended sentence.
14	James Flocks.....	Having lobsters in possession not purchased from lobster pond.....	Moncton.....	Fined \$2 each.
15	Thadée Comeau, Sylvain Le-Dupres, Ernest			
16	Francois Belliveau.....	Having illegally caught oysters in possession.....	St. Jean-Baptiste.....	Not guilty.
17	Xvon LeBlanc.....	Having in possession lobsters in close season.....	Grand Aldouane.....	Fined \$25.
18	Alexander Finn.....	Having in possession lobsters in close season.....	Waugh Woods.....	Fined \$50 or 30 days jail. Went to jail.
19	Edward Marcure.....	Having in possession lobsters in close season.....	Waugh Woods.....	Fined \$50 or 30 days jail. Went to jail.
20	Willie Connelly.....	Having in possession lobsters in close season.....	Waugh Woods.....	Not guilty.
21	Charles Godin.....	Having in possession lobsters in close season.....	Waugh Woods.....	Fined \$50 or 30 days jail. Went to jail.
22	Albennie Pettipas.....	Fishing for oysters illegally.....	Shediac bay.....	Fined \$25 or 30 days jail. Went to jail.
23	Herbert Clark.....	Having salmon in possession in close season.....	Lower Newcastle.....	Fined \$50 or 3 months jail. Went to jail.
24	Charles Glidden.....	Having salmon in possession in close season.....	Lower Newcastle.....	Fined \$50 or 3 months jail. Went to jail.
25	George MacDonald.....	Retaining undersized grille.....	Chatham.....	Not guilty.
25A	Henri Phault.....	Having lobsters in possession, illegally.....	Dalhousie, N.B.....	Fined \$5 or 15 days jail. Went to jail.
26	Patrick Gulligan.....	Having in possession lobsters in close season.....	Doylerville.....	Fined \$20 or 20 days jail. Went to jail.
27	Kenneth Finotte.....	Having in possession spear and jiggers for taking salmon.....	Jacquet river.....	Fined \$10. Suspended.
28	Andre V. Robichaud.....	Operating a lobster cannery without permit.....	Shippegan.....	Fined \$50 or 60 days jail. Case appealed.
29	Robert Finlotte.....	Having spear and jiggers to take salmon.....	Jacquet river.....	Appeal withdrawn.
30	Telesphore Guitar.....	Having in possession salmon in close season.....	Jacquet river.....	Fined \$10 or 10 days jail. Went to jail.
31	John Guitar.....	Having in possession salmon in close season.....	Jacquet river.....	Guilty. Went to jail.
32	Wilbert Guitar.....	Having in possession salmon in close season.....	Jacquet river.....	Fined \$10 or 10 days jail. Went to jail.
33	Vius Pellern.....	Having in possession salmon in close season.....	Jacquet river.....	Fined \$10. or 10 days jail.
34	Geo. A. Williston.....	Drifting for salmon inside statutory line.....	Miramichi bay.....	Fined \$12 to be paid by Dec. 31st.
35	Moss B. Williston.....	Drifting inside statutory line.....	Miramichi bay.....	Fined \$5.
36	Allan MacDonald.....	Drifting inside statutory line.....	Miramichi bay.....	Fined \$5.
37	Bernard MacDonald.....	Fishing for salmon without licence.....	Chatham.....	Not guilty.
38	John Metalick.....	Fishing for salmon in close season.....	Pt. aux Carr.....	Fined \$3, allowed to stand.
39	Edward E. LeBlanc.....	Salmon fishing in close season.....	Burnt Church.....	Fined \$10.
40	Ces. Allain.....	Fishing and selling undersized oysters.....	Buctouche, N.B.....	Fined \$5. Commitment out for arrest.
41	Elmer Glidden.....	Fishing for and selling undersized oysters.....	Buctouche, B.N.....	Fined \$5.
		Having in possession salmon in close season.....	Lower Newcastle.....	Fined \$10.



## NEW BRUNSWICK—DISTRICT No. 3—SUPERVISOR L. H. PARKS

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	Shirley Kelly.....	Interfering with an Officer in the discharge of his duty.	St. John river, York co.....	Fined \$50 or two months in jail; defendant went to jail; costs, \$11.40, paid by prosecution.
2	James B. Flannigan.....	Spent salmon in his possession contrary to Sec. 18, F.A. and Sec. 18, sub-sec. 14, F.R.	City Market, Fredericton.....	Fined \$10 or one month in jail; fine paid; costs, \$3.35, paid by defendant.
3	Russell Sewell.....	Using a drift-net to fish salmon.....	St. John river, Carleton co.....	Defendant bound over in sum of \$100 to keep the peace; costs, \$2.50, paid by defendant.
4	Zenis Brownlow.....	Using a drift-net to fish salmon.....	St. John river, Carleton co.....	Defendant bound over in sum of \$100 to keep the peace; costs, \$2.50, paid by defendant.
5	Joseph L. Albert.....	Fishing for trout with a gill-net.....	Lake Unique, Madawaska co..	Fined \$10 or 10 days in jail; suspended pending future actions; costs, \$9, paid by defendant.
6	A. K. McKinney.....	Fishing for shad in weekly close time.....	St. John river, Kings co.....	Fined \$10; costs, \$2.30, paid by defendant.
7	Denis Lizotte.....	Fishing trout with net contrary to Section 11, F.R.	Lake Unique, Madawaska co..	Fined \$10 or ten days in jail; defendant went to jail. costs, \$11.15, paid by prosecution.
8	Thomas Lizotte.....	Fishing for trout with net contrary to Section 11, F.R.	Lake Unique, Madawaska co..	Fined \$10 or ten days in jail; defendant went to jail; costs, \$7.55 paid by prosecution.
9	James Brown.....	Fishing for salmon with artificial light.....	Salmon river, Kent co.....	Fine 30 days in jail; suspended pending good behaviour; costs, \$1.75, paid by defendant.
10	Cecil Glen.....	Fishing for salmon with artificial light.....	Salmon river, Kent co.....	Fine 30 days in jail; suspended pending good behaviour; costs, \$1.75, paid by defendant.
11	Lester Robinson.....	Fishing for salmon with artificial light.....	Salmon river, Kent co.....	Fine 30 days in jail; suspended pending good behaviour; costs, \$1.75, paid by defendant.
12	Michael Young.....	Fishing trap-net during weekly close time contrary to Sec. 18, sub-sec. 9 (a), F.R.	Northwest Miramichi river, Northumberland co.	Fine \$5, paid; costs, \$5.25, paid by defendant.
13	Thomas Arbeau.....	Fishing for shad contrary to Section 21, sub-sec. 3, F.R.	Southwest Miramichi river, Northumberland co.	Fined \$5; suspended pending good behaviour; costs, \$5.70, paid by defendant.
14	Nelson Arbeau.....	Fishing for shad contrary to Section 21, sub-sec. 3, F.R.	Southwest Miramichi river, Northumberland co.	Fined \$5; suspended pending good behaviour; costs, \$5.70, paid by defendant.
15	Jack McCarty.....	Netting salmon.....	Tobique river, Victoria co....	Fined \$10; paid; costs, \$3.00, paid by defendant.
16	John Clark.....	Netting salmon.....	Tobique river, Vic. co.....	Fined \$10, paid; costs, \$5, paid by defendant.

17	Cash Dixon.....	Spearing for salmon with artificial light.....	St. John river, Victoria co.....	Fined \$10 or 30 days in jail; fine paid; costs, \$5.50, paid by defendant.
18	John Lennon.....	Spearing for salmon with artificial light.....	St. John river, Victoria co.....	Fined \$10 or 30 days in jail; fine paid; costs, \$5.50, paid by defendant.
19	Arthur McCue.....	Spearing for salmon with artificial light.....	St. John river, Victoria co.....	Fined \$10 or 30 days in jail; fine paid; costs, \$5.50, paid by defendant.
20	Stephen S. Banks.....	Having undersized salmon in his possession contrary to Sec. 18, sub-sec. 14, F.R.	City Market, Fredericton.....	Fine \$10, paid; costs, \$5.25, paid by defendant.
21	William Duncan.....	Having illegally caught salmon in his possession contrary to Sec. 18, F.A.	Renous river, Northumberland co.	Defendant signed bond of \$500 on own recognizance to keep the peace for one year; costs, \$11.00, paid by defendant.
22	Nicholas O'Brien.....	Fishing for salmon contrary to Sec. 18, sub-sec. 3, F.R.	Renous river, Northumberland co.	Defendant gave magistrate a bond of \$500 to keep the peace; costs, \$7.00, paid by defendant.
23	Henry Ouellette.....	Jigging for salmon.....	Therriault dam, Salmon river, Victoria co.	Fined \$10 or 30 days in jail; defendant went to jail; costs, \$16.20, paid by prosecution.
24	Chester Plant.....	Pollution of water by sawdust.....	Little river, Victoria co.....	Fine \$20, paid; costs, \$3.25, paid by defendant.
25	Wilmot Hatheway.....	Fishing for salmon with a gill-net in close season.....	St. John river, Victoria co.....	Fined \$10 or twenty days in jail; fine paid; costs, \$3.30, paid by defendant.
26	Roy Bishop.....	Having a net set for salmon without a licence contrary to Sec. 18, sub-sec. 3, F.R.	Salmon river, Queens co.....	Fined \$5, suspended; costs, \$22.05; case appealed to Queens co. court, to be heard in April, 1934.
27	Alva Hall.....	Drifting for salmon contrary to Sec. 18, sub-sec. 16 (c), F.R.	St. John river, York co.....	Fined \$50, suspended, and defendant bound over to keep the peace for one year; costs, \$3.25, paid by defendant.
28	Dawson Hall.....	Drifting for salmon contrary to Sec. 18, sub-sec. 16 (c), F.R.	St. John river, York co.....	Fined \$50, suspended, and defendant bound over to keep the peace for one year; costs, \$3.25, paid by defendant.
29	Roland Terrill.....	Having a net set for salmon contrary to section 18, sub-sec. 8, F.R.	Kenebecasis river, Kings co.....	Fined \$10, paid; costs, \$3.00, paid by defendant.
30	Frank Hanington.....	Killing fish with explosive material contrary to Sec. 26, F.A.	Cold stream, Carleton co.....	Bound over to keep the peace; costs, \$4.00, paid by defendant.
31	Rainsford Campbell.....	Killing fish with explosive material contrary to Sec. 26, F.A.	Cold stream, Carleton co.....	Bound over to keep the peace; costs, \$4.00, paid by defendant.
32	Cecil McCafferty.....	Jigging for salmon contrary to Sub-sec. 1, Sec. 18, F.R.	Marysville dam, Nashwaak river, York co.	Fined \$20 or 20 days in jail; defendant went to jail; costs, \$11.55, paid by prosecution.
33	Donald Peterson.....	Jigging for salmon contrary to Sub-sec. 1, Sec. 18, F.R.	Marysville dam, Nashwaak river, York co.	Fined \$15, or 15 days in jail; defendant went to jail; costs, \$11.55, paid by prosecution.
34	Hugh Peterson.....	Jigging for salmon contrary to Sub-sec. 1, Sec. 18, F.R.	Marysville dam, Nashwaak river, York co.	Fined \$10 or 10 days in jail; defendant went to jail; costs, \$16.05, paid by prosecution.
35	Roy Barton.....	Jigging for salmon.....	Marysville dam, Nashwaak river, York co.	Case dismissed, mistaken identity.

## PRINCE EDWARD ISLAND—SUPERVISOR S. T. GAULANT

Pros. Nos.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	Archie McDonald.....	Leaving shore before appointed time on opening of lobster season.	Darnley.....	Fined \$10 and costs, \$1.
2	Frank Anderson.....	Leaving shore before appointed time on opening of lobster season.	Savage harbour.....	Fined \$10—sentence suspended.
3	Vernon Anderson.....	Leaving shore before appointed time on opening of lobster season.	Savage harbour.....	Fined \$10—sentence suspended.
4	James B. McDonald.....	Leaving shore before appointed time on opening of lobster season.	Savage harbour.....	Fined \$10—sentence suspended.
5	Aeneas McDonald.....	Leaving shore before appointed time on opening of lobster season.	Savage harbour.....	Fined \$10—sentence suspended.
6	Simon McDonald.....	Leaving shore before appointed time on opening of lobster season.	Cape Spry.....	Fined \$5 and costs \$2.50.
7	Clyde Wentzel.....	Leaving shore before appointed time on opening of lobster season.	Cape Spry.....	Fined \$5 and costs \$2.50.
8	James Steele.....	Leaving shore before appointed time on opening of lobster season.	Cape Spry.....	Case dismissed; costs, \$2.50. to be paid by prosecution.
9	Leon Johnston.....	Leaving shore before appointed time on opening of lobster season.	Cape Spry.....	Fined \$5 and costs \$2.50.
10	Earl Sprague.....	Fishing lobsters without a licence.....	Between Victoria and point Prim.	Fined \$20 and costs; judgment reversed by Supreme Court; costs paid by prosecution.
11	Thornton Ogden.....	Fishing lobsters without a licence.....	Between Victoria and point Prim.	Fined \$20 and costs; judgment reversed by Supreme Court; costs paid by prosecution.
12	Gessler McClashing.....	Fishing lobsters without a licence.....	Between Victoria and point Prim.	Fined \$10 and costs, \$4.35.
13	Marcellus Campbell.....	Fishing lobsters without a licence.....	Between Victoria and point Prim.	Fined \$20 and costs; judgment reversed; costs paid by prosecution.
14	Major Boyce.....	Fishing lobsters without a licence.....	Between Victoria and point Prim.	Fined \$20 and costs; judgment reversed; costs paid by prosecution.
15	Dennis Cormier.....	Fishing lobsters without a licence.....	Between Victoria and point Prim.	Case dismissed; costs paid by prosecution.
16	Alton Allen.....	Fishing lobsters without a licence.....	Between Victoria and point Prim.	Fined \$5 and costs \$3.
17	Walter Arsenault.....	Netting trout.....	Dunk river.....	Fined \$20 and costs \$1.50.
18	Joseph Gouin.....	Fishing lobsters in close season.....	Hardy's channel.....	Fined \$35 and costs \$2.
19	Ernest Arsenault.....	Fishing lobsters in close season.....	Hardy's channel.....	Fined \$25 and costs \$2.
20	Wm. T. Reilly.....	Fishing lobsters in close season.....	Hardy's channel.....	Fined \$5 and costs \$2; five crates of lobsters and 200 cans (non-processed) confiscated.
21	Alfred Powers.....	Fishing lobsters in close season.....	Alberton.....	Fined \$25 and costs \$2.
22	Gerald Chaisson.....	Having lobsters in possession in close season.....	Nail pond.....	Fined \$25 and costs \$2.



23	Harry Heckbert.....	Oysters in possession in close season.....	Glover's lane.....	Fined \$20 and costs \$2; (moiety to R.C. M.P.) 1½ bushels oysters seized and returned to water.
24	James Skerry.....	Having lobsters in possession in close season.....	Alberton.....	Fined \$25 and costs \$2.
25	John W. Gamble.....	Fishing oysters in close season.....	Grand river.....	Fined \$25.
26	Jack McKenzie.....	Possession of lobsters, close season.....	French river.....	Fined \$25 and costs \$5.20; (moiety to R.C.M.P.).
27	Wm. Turner.....	Fishing lobsters in close season.....	Malpeque.....	Case dismissed; costs \$2 paid by prosecution.
28	Ellsworth Gillis.....	Fishing qualaugs without a licence.....	Bideford river.....	Fined \$30 and costs \$17.73; case appealed.
29	Edward F. Clark.....	Fishing lobsters in close season.....	Lagoons, Magdalen islands.....	Fined \$15 and costs \$12.50.
30	Snowball Allen.....	Fishing lobsters in close season.....	Between Victoria and point Prim.....	Case dismissed; cost, \$24.25, paid by Department.
31	Newton Taylor.....	Obstructing a fisheries officer in discharge of his duties.....	St. Peters island.....	Fined \$1 and costs, \$3.64.
32	Stanley Taylor.....	Obstructing a fisheries officer in discharge of his duties.....	St. Peters Island.....	Fined \$1 and costs \$3.64.
33	Raymond Taylor.....	Obstructing a fisheries officer in discharge of his duties.....	St. Peters Island.....	Fined \$1. and costs \$3.64.
34	Roy Taylor.....	Obstructing a fisheries officer in discharge of his duties.....	St. Peters island.....	Fined \$1 and costs \$3.64.
35	Weldon Taylor.....	Obstructing a fisheries officer in discharge of his duties.....	St. Peters island.....	Fined \$1 and costs \$3.64.
36	Wm. Taylor.....	Obstructing a fisheries officer in discharge of his duties.....	St. Peters island.....	Fined \$5 and costs \$3.64.
37	John Gallant.....	Carrying lobsters in bags to cannery.....	Summerside.....	Case dismissed; costs \$6.85 paid by Department.

BRITISH COLUMBIA—CHIEF SUPERVISOR, MAJOR J. A. MOTHERWELL  
DISTRICT No. 1—SUPERVISOR R. W. MACLEOD

1	O. C. Hornbrook.....	Fishing salmon with grill-net without licence.....	Fraser river.....	Fined \$2.50, costs \$2.50, 7 lbs. salmon confiscated.
2	Harry Joseph.....	Fishing during weekly closed season.....	Fraser river.....	Fined \$10 or 30 days gaol and costs \$1.75; salmon grill-net confiscated.
3	Silvio Sdecco.....	Violation Sec. 1, s.s. 15h, Fishery Regulations.....	Violin lake.....	Suspended sentence.
4	Antonio Marletti.....	Violation Sec. 1, s.s. 15h, Fishery Regulations.....	Violin lake.....	Suspended sentence.
5	W. J. and C. W. Hoover.....	Allowing sawdust in Salmon river.....	Salmon river.....	Suspended sentence.
6	Victor Fors.....	Violation Sec. 1, s.s. 7, Fishery Regulations.....	Big Sheep creek.....	Fined \$5 and \$1.50 costs, 14 small trout confiscated.
7	S. G. Biagnioni.....	Violation Sec. 1, s.s. 7, Fishery Regulations.....	Big Sheep creek.....	Fined \$5 and \$1.50 costs, 13 small trout confiscated.
8	Victor Naden.....	Violation Sec. 1, s.s. 6, Fishery Regulations.....	Big Sheep creek.....	Fined \$10 and \$2 costs, 81 small trout confiscated.
9	M. R. Maze.....	Violation Sec. 1, s.s. 6, Fishery Regulations.....	Big Sheep creek.....	Fined \$5 and \$1.50 costs, 29 small trout confiscated.

BRITISH COLUMBIA—DISTRICT No. 1—*Concluded*

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
10	W. J. Teman.....	Violation Sec. 1, s.s. 6, Fishery Regulations.....	Big Sheep creek.....	Fined \$5 and \$1.50 costs, 29 small trout confiscated.
11	W. Johnson.....	Violation Sec. 1, s.s. 6, Fishery Regulations.....	Big Sheep creek.....	Fined \$5 and \$1.50 costs, 25 small trout confiscated.
12	P. Secco.....	Violation Sec. 1, s.s. 4, Fishery Regulations.....	Big Sheep creek.....	Fined \$10 and \$2 costs, piece of net confiscated.
13	J. Peters.....	Violation Sec. 15, s.s. (e), Fishery Regulations.....	Cottonwood lake.....	Fined \$10 and \$3.75 costs, rod, reel, line, and 19 trout confiscated.
14	Thomas Ritchie.....	Possession of illegal fishing gear.....	Mission.....	Fined \$1 and \$1.75 costs.
15	Tarakazu Tamaki.....	Violation Sec. 16, s.s. 5, Fishery Regulations.....	Fraser river.....	Fined \$10 and \$2.50 costs.
16	Watari Sugawara.....	Violation Sec. 16, s.s. 5, Fishery Regulations.....	Fraser river.....	Fined \$15 and \$2.50 costs.
17	Shigeo Nishimura.....	Violation Sec. 16, s.s. 5, Fishery Regulations.....	Fraser river.....	Fined \$15 and \$2.50 costs.
18	P. Tipton.....	Fishing during weekly closed period.....	Pt. Grey.....	Fined \$5 and \$2 costs.
19	J. Matheson.....	Violation Sec. 8, Fishery Regulations.....	Fraser river.....	Fined \$25 and \$2.50 costs.
20	Chin Lee.....	In possession undersized sturgeon.....	Sunbury.....	Fined \$2.50 and \$2.50 costs.
21	Enar Karlson.....	Fishing in closed area.....	Indian river.....	Fined \$10 and \$3.50 costs.
22	George Linnell.....	Fishing in closed area.....	Indian river.....	Fined \$10 and \$3.50 costs.
23	Jesse Armishaw.....	Fishing with gill-net without licence.....	Fraser river.....	Fined \$2.50.
24	John Englezo.....	Violation Sec. 8, Fishery Regulations.....	Fraser river.....	Case dismissed.
25	Nick Lorick.....	Fishing with salmon purse-seine in prohibited waters.....	Fraser river.....	Fined \$15 and \$5 costs.
26	Ivan Jannis.....	Fishing with salmon purse-seine in prohibited waters.....	Fraser river.....	Fined \$15 and \$5 costs.
27	Nickola Jauncich.....	Fishing with salmon purse-seine in prohibited waters.....	Fraser river.....	Fined \$15 and \$5 costs.
28	Charles Bird.....	Fishing for salmon with dip-net.....	Fraser river.....	Fined \$20 and 1 dip net and 1 sockeye salmon confiscated.
29	Alex. Bird.....	Fishing for salmon with dip net.....	Fraser river.....	Fined \$20 or 20 days' gaol.
30	James Pierroy.....	Fishing for salmon with dip net.....	Fraser river.....	Fined \$20 or 20 days' gaol.
31	Albert Pierroy.....	Fishing for salmon with dip net.....	Fraser river.....	Fined \$20 or 20 days' gaol.
32	John E. Jacobson.....	Fishing with net during weekly closed season.....	Canoe pass.....	Fined \$5 and \$2.50 costs; 48 chum and 8 coho salmon confiscated.
33	Jutaro Obayashi.....	Fishing with net without licence.....	Fraser river.....	Fined \$10 and \$2.50 costs.
34	Sam Hornbrook.....	Violation Sec. 39 Fisheries Act.....	Fraser river.....	Fined \$100 and \$2.50 costs.
35	Sam Hornbrook.....	Violation Sec. 19, s.s. 2a, Fishery Regulations.....	Fraser river.....	Fined \$15 and \$2.50 costs.
36	S. A. Nelson.....	Violation Sec. 11, s.s. 2, Fishery Regulations.....	Fraser river.....	Fined \$25 and \$2.50 costs.
37	Robert Woof.....	Violation Sec. 16, s.s. 2, Fishery Regulations.....	Port Kells.....	Fined \$10 and \$2.50 costs, 3 nets, rowboat, oars, and 22 salmon confiscated.
38	Jacob Tantre.....	Violation Sec. 19, s.s. 6, Fishery Regulations.....	Mt. Lehman.....	Fined \$2.50 and \$2.50 costs.
39	M. Grandholm.....	Violation Sec. 19, s.s. 2, Fishery Regulations.....	N. Arm Fraser river.....	Fined \$15 and \$2.50 costs, gill-net confiscated.

40	George Wilson.....	Violation Sec. 16, s.s. 2, Fishery Regulations.....	Indian river.....	Fined \$1 and \$3.50 costs.
41	Sam Hornbrook.....	Fishing during weekly closed season.....	Fraser river.....	Fined \$5 and \$2.50 costs.
42	Ford Trinnell.....	Fishing during weekly closed season.....	Fraser river.....	Fined \$2.50 and \$2.50 costs, gill-net confiscated.
43	Alex. McCaulay.....	Fishing in closed area.....	Indian river.....	20 days served in gaol.
All	W. M. Hotham, Ltd.....	Violation Meat and Canned Foods Act.....	Vancouver.....	Fined \$15 and \$2.50 costs.

## DISTRICT No. 2—SUPERVISOR J. BOYD

1	Geo. Cunningham.....	Unlawful possession salmon in closed area.....	Skeena river.....	Suspended sentence; sail boat, sail, oars, rowlocks and 339 salmon confiscated.
2	Archie Cameron.....	Unlawful possession salmon in closed area.....	Skeena river.....	Suspended sentence.
3	Wm. Boudering.....	Unlawful possession salmon in closed area.....	Skeena river.....	Suspended sentence.
4	Jos. Boroevich.....	Fishing in prohibited waters.....	Blair inlet.....	Fined \$200 and \$70.10 costs.
5	Olof Burge.....	Violation Sec. 19, s.s. 7a, Fishery Regulations.....	Langara island.....	Fined \$5.
6	Frank Lesizynski.....	Violation Sec. 19, s.s. 7a, Fishery Regulations.....	Shag rock.....	Fined \$5 and \$2.50 costs or 10 days' gaol.
7	Joe Abrattis.....	Violation Sec. 19, s.s. 7a, Fishery Regulations.....	Shag rock.....	Fined \$5 and \$2.50 costs or 10 days' gaol.
8	J. Saunders.....	Fishing above boundary.....	Head North Bentinck arm.....	Fined \$5.
9	Wm. Cooper.....	Fishing above boundary.....	Head North Bentinck arm.....	Fined \$5.
10	Peter Sandy.....	Fishing during weekly closed season.....	Head North Bentinck arm.....	Fined \$5.
11	Harry Sparks.....	Fishing above boundary.....	Head North Bentinck arm.....	Fined \$5.
12	A. Nesloss.....	Fishing during weekly closed season.....	Fitzhugh sound.....	Fined \$10.
13	K. Jackson.....	Fishing above boundary.....	Rivers inlet.....	Fined \$25.
14	Axel E. Anderson.....	Fishing above boundary.....	Schooner pass.....	Fined \$10.
15	Geo. Edwards.....	Fishing during weekly closed season.....	Rivers inlet.....	Case dismissed.
16	V. Matson.....	Fishing inside boundary.....	Schooner pass.....	Case dismissed.
17	J. Wilson.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
18	Moses Edgar.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Fined \$25, 31 sockeye salmon confiscated.
19	W. Williams.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Fined \$25, 25 sockeye salmon confiscated.
20	Jan Srsic.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Fined \$25, 21 sockeye salmon confiscated.
21	D. Williams.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Fined \$5, 69 sockeye salmon confiscated.
22	D. Assu.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Fined \$10, 49 sockeye salmon confiscated.
23	D. McMillan.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Fined \$25.
24	Neil McLeod.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Fined \$15, 11 sockeye salmon confiscated.
25	C. Jensen.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Fined \$25, 11 sockeye salmon confiscated.
26	F. Rogers.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
27	J. Lee.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
28	Hy. Mitchell.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
29	G. Price.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
30	E. Guerin.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
31	Ian Munro.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
32	A. Murray.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
33	J. Jumbo.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
34	A. Falk.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
35	Hy. Nelson.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
36	T. Johnston.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.
37	A. Smith.....	Fishing inside fishery boundary.....	Head of Rivers inlet.....	Case dismissed.



BRITISH COLUMBIA—DISTRICT No. 2—*Concluded*

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
38	Frank Miller.....	In possession of fish above commercial boundary..	Skeena river.....	Fined \$50 and \$2.25 costs, gas boat, net, and 434 salmon confiscated.
39	Harry Fairley.....	In possession of fish above commercial boundary.....	Skeena river.....	Fined \$50 and \$2.25 costs.
40	Otto Olsen.....	In possession of fish above commercial boundary.....	Skeena river.....	Fined \$50 and \$2.25 costs.
41	Chester Leask.....	Fishing during weekly closed time.....	Dogfish bay.....	Fined \$100 and \$2.50 costs.
42	Jacob Astar.....	Fishing during weekly closed time.....	Curtis inlet.....	Fined \$20 and \$2.50 costs.
43	John Dalhberg.....	Having gill-net aboard collecting boat.....	Quinstonsta harbour.....	Fined \$15 and \$2.50 costs, gill-net confiscated.
44	Aubrey Jackson.....	Having gill-net aboard collecting boat.....	Quinstonsta harbour.....	Fined \$15 and \$2.50 costs.
45	John White.....	Fishing above boundary.....	Deer pass.....	Fined \$100 and \$9.60 costs.
46	John Starr.....	Fishing above boundary.....	Deer pass.....	Fined \$100 and \$9.60 costs.
47	Paul Windsor.....	Fishing above boundary.....	Deer pass.....	Fined \$100 and \$9.60 costs, small drag-seine confiscated.
48	John Vukovich.....	Operating gear in closed area.....	S. Bentinck arm.....	Fined \$100 and \$6.50 costs.
49	A. Drager.....	Fishing inside boundary.....	Rivers inlet.....	Fined \$25.
50	Alex. Angus.....	Unlawfully having salmon in possession.....	Naas river.....	Fined \$25 and \$2.50 costs.
51	Sam. J. Gray.....	Buying salmon from an Indian.....	Naas river.....	Fined \$50 and \$2.50 costs.
52	M. Caspersen.....	Fishing above fishing boundary.....	Kwatna inlet.....	Fined \$20 and \$3.75 costs.
53	John Dahl.....	Fishing above fishing boundary.....	Borrowman bay.....	Fined \$60, \$2.50 costs, and 19 coho salmon confiscated.
54	Chris Waag.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Huston inlet.....	Fined \$150 and \$17.75 costs.

DISTRICT No. 3—SUPERVISOR J. F. TAIT

1	George Lowe.....	Violation Sec. 1, s.s. 4, Fishery Regulations.....	Shawinigan lake.....	Fined \$5 and \$2.75 costs.
2	Herbie Gabourie.....	Violation Sec. 5, s.s. 7, Fishery Regulations.....	Cowichan bay.....	Fined \$2 and \$2.75 costs.
3	Gordon Hartley.....	Violation Sec. 1, s.s. 4, Fishery Regulations.....	Rogers lake.....	Fined \$10 and \$2.75 costs.
4	John Benic.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Nimnat lake.....	Fined \$25 or 14 days' gaol.
5	Alfred Dawson.....	Fishing salmon during weekly closed season.....	Nimkish river.....	Case dismissed.
6	Harold Forsmo.....	Violation Sec. 11, s.s. 1, Fishery Regulations.....	Barclay sound.....	Fined \$25 and \$2.25 costs.
7	William MacKay.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobarton river.....	Fined \$10 and \$2.50 costs, 65 sockeye salmon confiscated.
8	Edward Clutesi.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Somass river.....	Fined \$50 or 1 month gaol, salmon drag-seine, 3 canoes, 1 skiff, and 19 sockeye salmon confiscated.
9	Alfred Fred.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Somass river.....	Fined \$50 or 1 month gaol.
10	Rochester Peter.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Somass river.....	Fined \$50 or 1 month gaol.
11	Andrew Clapus.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Somass river.....	Fined \$50 or 1 month gaol.

12	Willie Hipee.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Somass river.....	Fined \$50 or 1 month gaol.
13	Henry Bill.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Somass river.....	Fined \$50 or 1 month gaol.
14	Fred Gus.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Somass river.....	Case dismissed.
15	Axel Larson.....	Violation Sec. 16, s.s. 19, Fishery Regulations.....	Pill point.....	Fined \$25 and \$2.25 costs.
16	Bert Ernst.....	Violation Sec. 16, s.s. 19, Fishery Regulations.....	Pill point.....	Fined \$25 and \$2.25 costs.
17	John R. R. Hill.....	Violation Sec. 1, s.s. 5, Fishery Regulations.....	Sansum narrows.....	Fined \$2.50 and \$2.75 costs.
18	Wm. H. Jennings.....	Violation Sec. 1, s.s. 5, Fishery Regulations.....	Sansum narrows.....	Fined \$2.50 and \$4.25 costs.
19	John D. Macaulay.....	Violation Sec. 16, s.s. 19, Fishery Regulations.....	Pill point.....	Fined \$25 and \$2.25 costs.
20	Shoichi Nishi.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Anderson river.....	Fined \$25 and \$2.25 costs.
21	Joshua Edger.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobarton river.....	Fined \$10 and \$1.00 costs.
22	Simon Chester.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobarton river.....	Fined \$10 and \$1.00 costs.
23	Bob Joseph.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobarton river.....	Fined \$10 and \$1.00 costs, salmon purse-seine confiscated.
24	Chief Dick.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobarton river.....	Fined \$10 and \$1 costs.
25	George Gibbs.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobarton river.....	Fined \$10 and \$1 costs.
26	Ernie Wickham.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobarton river.....	Case dismissed.
27	Eric Wickham.....	Violation Sec. 16, s.s. 19, Fishery Regulations.....	Hobarton river.....	Fined \$25 and \$2.25 costs.
28	Sam Snyder.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Anderson river.....	Fined \$25 and \$2.25 costs.
29	George Anton.....	Fishing during weekly closed season.....	Nimkish river.....	Fined \$25 or 30 days' gaol.
30	Gerald Chevalier.....	Fishing during weekly closed season.....	Nimkish river.....	Fined \$5
	F. Shields.....	Fishing during weekly closed season.....	Nimkish river.....	Fined \$5 and costs \$6.50.
31	T. Davis.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Nimkish river.....	Fined \$5
32	W. F. Rose.....	Violation Sec. 1, s.s. 12, para. 12 (d) Regulations.....	Phillips arm.....	Fined \$5
33	Koyoshi Okuda.....	Violation Sec. 1, s.s. 4, Fishery Regulations.....	Puntledge river.....	Fined \$1.
34	Thorne Duncan.....	Violation Sec. 16, s.s. 2, Fishery Regulations.....	Puntledge river.....	Fined \$1.
35	John Logvinoff.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Agamemnon channel.....	Fined \$10 and \$1.75 costs.
36	John Rivers.....	Violation Sec. 16, s.s. 2, Fishery Regulations.....	Uchucklesit harbour.....	Fined \$10 and \$4 costs.
37	Martin Johnstone.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Sunshine bay, Barclay sound.....	Fined \$25 and \$4 costs.
38	James Mallabone.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobarton river.....	Fined \$10 and \$1 costs.
39	Ernest Lauder.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Uchucklesit harbour.....	Fined \$25 and \$2.25 costs.
40	Jimmie Gallic.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Anderson river.....	Case dismissed.
			Anderson river.....	Fined \$25 and grill-net and 11 sockeye salmon confiscated.
41	Hank Thomas.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Anderson river.....	Case dismissed.
42	Herbert Martin.....	Using salmon purse-seine as set net.....	Johnstone straits.....	Fined \$5 and \$3.75 costs, 26 salmon confiscated.
43	Otto Luck.....	Fishing salmon above boundary.....	Kingcome inlet.....	Fined \$25.
44	Oscar J. Wickstrom.....	Fishing above boundary line.....	Wakoman sound.....	Fined \$25.
45	Sandy Billy, Solomon Louie, Thos. Price, Sr., Thos Price, Jr., Ernest Price, Johnny MacLean.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Discovery passage.....	Suspended sentence.
46	Walter Elliott.....	Violation Sec. 16, s.s. 12, Fishery Regulations.....	Cowichan river.....	Fined \$20 or 1 month gaol.
47	Sam Hunt.....	Unlawfully in possession of salmon.....	Broughton straits.....	Fined \$5 and \$3.75 costs, 505 salmon confiscated.
48	Basil Joe.....	Fishing inside boundary with seine.....	Deserted bay.....	Fined \$50 and \$2.50 costs.
49	Anton Serka.....	Violation Sec. 22, para. 2 Fishery Regulations.....	Kowshet cove.....	Fined \$20 and \$2.50 costs, 49 salmon confiscated.

BRITISH COLUMBIA—DISTRICT No. 3—*Concluded*

Pros. No.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
50	Bruce Seaweed.....	Bringing salmon from above commercial boundary	Klucksivi river.....	Fined \$10 and \$5.25 costs; 78 salmon confiscated.
51	William Rafter.....	Bringing salmon from above commercial boundary	Klucksivi river.....	Fined \$300 or 3 months' gaol.
52	George Charlie.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Malksope inlet.....	Fined \$50.
53	Oscar Dean.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Malksope inlet.....	Fined \$50.
54	Kristian Johansen.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Nitinat lake.....	Fined \$15 and \$3.75 costs.
55	Norman Gunderson.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Nitinat lake.....	Fined \$15 and \$3.75 costs.
56	Vernar Carlson.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Nitinat lake.....	Fined \$15 and \$3.75 costs.
57	Jack Myers.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Nitinat lake.....	Fined \$15 and \$3.75 costs.
58	Martin Magnusen.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Nitinat lake.....	Fined \$15 and \$3.75 costs.
59	G. A. E. Wyllys.....	Violation Sec. 1, s.s. 4, Fishery Regulations.....	Saanich arm.....	Fined \$5 and \$3.75 costs.
60	August Murphy.....	Violation Sec. 16, s.s. 16b, Fishery Regulations.....	Muchalat arm.....	Fined \$1, 6 spring salmon confiscated.
61	Jack Leukholm.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Nitinat arm.....	Fined \$15 and \$3.75 costs.
62	Eric Wiekham.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Nitinat arm.....	Case dismissed.
63	Frank Cvitanovich.....	Violation Sec. 6, Fishery Regulations.....	Stuart channel.....	Fined \$50 and \$9.50 costs.



DOMINION OF CANADA

FIFTH  
ANNUAL REPORT  
OF THE  
DEPARTMENT OF FISHERIES

(SIXTY-EIGHTH ANNUAL FISHERIES REPORT  
OF THE DOMINION)

---

FOR THE YEAR

1934-35



OTTAWA  
J. O. PATENAUDE, I.S.O.,  
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY  
1935



*To His Excellency Captain the Right Honourable the Earl of Bessborough,  
P.C., G.C.M.G., Governor General and Commander-in-Chief of the  
Dominion of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

I have the honour to submit herewith, for the information of your Excellency and the Parliament of Canada, the Fifth Annual Report of the Department of Fisheries, being the Sixty-eighth Annual Fisheries Report for the Dominion.

I have the honour to be,

Your Excellency's most obedient servant,

GROTE STIRLING,  
Acting Minister of Fisheries.

DEPARTMENT OF FISHERIES,  
OTTAWA, April 6, 1935.



## CONTENTS

DEPUTY MINISTER'S REPORT COVERING—	PAGE
Review of the Fisheries for the Calendar Year 1934.....	5
Fisheries Foreign Trade.....	13
Instructional Work.....	15
Inspection of Plants and Products.....	17
Fish Culture.....	18
Expanding Oyster Cultivation.....	18
Pacific Coast Scallop Dragging.....	19
Biological Board Research.....	20
Expanding Demand for Fish Foods.....	21
Lobster Transportation Service to the United States.....	21
Fisheries Intelligence.....	23
Fur Seal Returns.....	24
Fishing Bounty.....	24
North American Council on Fishery Investigations.....	26
International Fisheries Commission, 1934-1935.....	28

## APPENDICES

1. Reports of the Chief Supervisors of Fisheries.....	32
2. Summary of the Work of the Biological Board of Canada.....	84
3. Report of the Fish Culture Branch of the Department.....	90
4. Report on Inspection of Fish and on Technical Instruction to Fishermen and Fishery Officers.....	167
5. Report of the Fisheries Engineer.....	170
6. Report on Oyster Cultural Work by the Department in 1934.....	181
7. Report to the 1934 Meeting of the North American Council on Fishery Investigations by the Council's Sub-Committee on Haddock Investigations.....	186
8. A Statement of Fisheries Expenditure and Revenue for the Fiscal Year 1934-35 and a Summary of Expenditure and Revenue, by Provinces, for the Period 1867 to 1934-35.....	188
9. A Summary Showing the Number of Licences Issued in 1934.....	194
10. A Summary of Lobster Fishing Licences Issued Each Year since 1928.....	197
11. A Return Showing the Prosecutions for Offences under the Fisheries Act.....	199

## DEPUTY MINISTER'S REPORT

To the HON. GROTE STIRLING,  
Acting Minister of Fisheries.

SIR,—I have the honour to submit the Fifth Annual Report of the Department of Fisheries, which is the Sixty-eighth Annual Report on the fisheries of Canada, and is for the fiscal year ended March 31, 1935. The report refers to the following subjects, among others:—

Fisheries Operations in the Calendar Year, 1934.

Foreign Trade in Fisheries Products.

Fisheries Instructional Work.

Fish Inspection Work.

Fish Culture.

Development of Oyster Farming in Prince Edward Island.

Exploratory Scallop Dragging in British Columbia.

The Work of the Biological Board of Canada.

Expanding the Demand for Canadian Fish Foods.

Lobster Transportation Service.

Fisheries Intelligence.

Pelagic Sealing.

Fishing Bounty Payments.

The Work of the North American Council on Fishery Investigations.

The Work of the Pacific Halibut Commission or the International Fisheries Commission.

The appendices include:—

Reports of the Chief Supervisors of Fisheries.

Summary of the Work of the Biological Board of Canada.

Report of the Fish Culture Branch of the Department.

Report on Inspection of Fish and on Technical Instruction to Fishermen and Fishery Officers.

Report of the Fisheries Engineer.

Report on Oyster Cultural Work by the Department in 1934.

Report to the 1934 Meeting of the North American Council on Fishery Investigations by the Council's Sub-Committee on Haddock Investigations.

A Statement of Fisheries Expenditure and Revenue for the Fiscal Year 1934-35 and a Summary of Expenditure and Revenue, by Provinces, for the Period 1867 to 1934-35.

A summary showing the Number of Licences Issued in 1934.

A Summary of Lobster Fishing Licences Issued Each Year since 1928.

A Return Showing the Prosecutions for Offences under the Fisheries Act.

### REVIEW OF THE FISHERIES FOR THE CALENDAR YEAR 1934

Increased catches were reported from the fisheries of each of the provinces during the calendar year 1934 but there was a slight decrease in the case of the Yukon territory. The total landings of all kinds of sea fish, fresh-water and

shell-fish, amounted to 933,086,900 pounds and they had a marketed value of \$34,121,941. In the preceding year the catch was 785,460,000 pounds with a marketed value of \$27,558,053. Of the total catch for the year under review, 861,392,000 pounds were taken from the sea and 71,694,900 pounds from the inland waters. The sea fisheries contributed \$29,341,356 to the marketed value and the inland fisheries \$4,780,585.

The individual fisheries of greatest production are the salmon and cod fisheries and each of these showed large increases in catch in 1934. The biggest salmon fishery is on the Pacific coast and here the increase in the catch was almost 25,000,000 pounds. The cod fishery, on the other hand, is centred chiefly on the Atlantic coast and in this case there was an increase of more than 14,000,000 pounds in the year's catch.

Table I, below, shows the marketed value of the 1934 production by provinces, and gives also the figures for each of the four preceding years. In table II, the marketed value figures for the sea and inland fisheries, respectively, for 1934 are shown.

TABLE I

—	1934	1933	1932	1931	1930
	\$	\$	\$	\$	\$
Nova Scotia.....	7,673,865	6,010,601	6,557,943	7,986,711	10,411,202
New Brunswick.....	3,679,588	3,061,152	2,972,682	4,169,811	4,853,575
Prince Edward Island.....	963,926	842,345	988,919	1,078,901	1,141,279
Quebec.....	2,306,517	2,128,471	1,815,544	1,952,894	2,502,998
Ontario.....	2,218,550	2,089,842	2,147,990	2,477,131	3,294,629
Manitoba.....	1,465,358	1,076,136	1,204,892	1,241,575	1,811,962
Saskatchewan.....	219,772	186,417	186,174	317,963	234,501
Alberta.....	245,405	144,518	153,789	153,897	421,258
British Columbia.....	15,334,335	12,001,471	9,909,116	11,108,873	23,103,302
Yukon Territory.....	14,625	17,100	20,060	29,550	29,510
Total.....	34,121,941	27,558,053	25,957,109	30,517,306	47,804,216

TABLE II

—	Sea	Inland	Total
	\$	\$	\$
Nova Scotia.....	7,673,865	.....	7,673,865
New Brunswick.....	3,652,082	27,506	3,679,588
Prince Edward Island.....	963,926	.....	963,926
Quebec.....	1,717,148	589,369	2,306,517
Ontario.....	.....	2,218,550	2,218,550
Manitoba.....	.....	1,465,358	1,465,358
Saskatchewan.....	.....	219,772	219,772
Alberta.....	.....	245,405	245,405
British Columbia.....	15,334,335	.....	15,334,335
Yukon Territory.....	.....	14,625	14,625
Total.....	29,341,356	4,780,585	34,121,941

*Capital Investment and Personnel.*—Plant and equipment of all kinds in use in the industry during the year represented an investment of \$43,369,530, which was an increase of almost \$2,500,000. Of the 1934 total, \$26,212,703 was the investment in vessels, boats, gear, and wharves used in the primary operations, that is, in catching and landing the fish. In secondary operations, or the canning and curing operations conducted on shore, there was invested a total of \$17,156,827. On the primary operations side \$21,944,952 was the sea fisheries investment and \$4,267,751 the investment in inland fisheries.



The number of persons engaged in the industry was 82,372, an increase of 3,044. Of the total, 68,634 were engaged in catching and landing the fish, (57,539 in sea fisheries and 11,095 in inland waters), and 14,738 were employed in canneries and fish curing establishments.

*Major Fisheries.*—The salmon fishery is the most important single fishery of Canada and the year's commercial catch for the whole country was 169,621,900 pounds with a marketed value of \$12,813,600. The British Columbia salmon catch was 165,990,000 pounds, having a marketed value of \$12,351,641. The lobster fishery on the Atlantic coast was second in point of marketed value, \$4,269,764. The landings of lobsters totalled \$36,199,200 pounds. The cod fishery on the Atlantic coast came third with a catch of 170,124,800 pounds and a marketed value of \$3,284,482. The marketed value return from the whitefish fishery, which is the chief of the inland fisheries, was \$1,358,692, an increase of more than \$200,000.

#### NOVA SCOTIA

Nova Scotia's fishermen made a catch of 238,003,300 pounds of fish and shellfish during the year, as compared with 215,521,700 pounds in 1933. The marketed value of the production was \$7,673,865, which was an increase of \$1,662,264 over the 1933 value. Lobsters and cod were the most important species, from the value standpoint, the catch of the former having a marketed value of \$2,487,653 and the cod a value of \$2,068,566; in each instance the value was more than a half a million dollars greater than in the year before. The catch of lobsters amounted to 18,459,000 pounds and of cod, 100,667,300 pounds. There were 34,150,600 pounds of haddock landed, an increase of more than 8,500,000 pounds. Hake and pollock were also taken in much larger quantities, the catches being almost double those of the preceding year. Decreases were recorded in the catches of both herring and mackerel while smaller catches of halibut and swordfish were also made. The salmon catch, 604,800 pounds, was less by more than 200,000 pounds than in 1933. The quantity of scallops landed was 36,568 barrels, which was an increase of almost 6,000 barrels. The output of fish meal was 4,670 tons, an increase of more than 600 tons.

#### NEW BRUNSWICK

The catch of fish for New Brunswick, both sea and inland, amounted to 135,738,900 pounds with a marketed value of \$3,562,082. In the year before the figures were 129,995,200 pounds and \$3,061,152. In the sea fisheries landings of pollock, sardines, tomcod and clams were the only ones of importance to show increases in 1934, in so far as the catches went. On the marketed value side sardines made by far the best showing, making the main contribution to the total increase for the province. Improved prices for fish marketed in the various forms, however, helped to increase the marketed value as a whole, notwithstanding decreased catches in so many branches of the fisheries. The catch of sardines amounted to 191,155 barrels, an increase of more than 61,000 barrels. There were 1,470,000 pounds of tomcod taken, which was more than double the catch of the previous year. (These fish are used to a large extent for fox feed). Catches of important species such as lobsters and smelts fell off somewhat, the former dropping 986,000 pounds and the latter 1,557,600 pounds. The catch of salmon, 1,858,400 pounds, showed a drop of almost 403,000 pounds. The total inland catch of all varieties was 480,000 pounds, which represented an increase of 118,000 pounds. The catch of shad, in inland waters, 274,200 pounds, increased by more than 58,000 pounds.

## PRINCE EDWARD ISLAND

The marketed value of the fisheries of Prince Edward Island for the year was \$963,926, compared with \$842,345 in 1933, while the total quantity of all kinds of fish and shellfish landed was 23,326,200 pounds, a decrease of 978,900 pounds.

The lobster industry is the most valuable branch of the fisheries in the island, the marketed value of its products last year being \$674,186 or about 70 per cent of the total value of the fisheries production of the province. The catch was 7,658,200 pounds, or a drop of 1,496,500 pounds. Increased landings of clams and oysters were made but smaller catches of all other species.

## QUEBEC

Quebec's catch for the year, inland and sea landings combined, was 106,562,300 pounds, as compared with 93,336,100 pounds in the preceding year while the marketed value was \$2,306,517 as against \$2,128,471. The quantity of cod landed was 51,863,800 pounds, which represented a slight increase, and its marketed value, \$909,300, was some \$45,000 more than in the year before. The cod fishery is the largest division of the fishing industry in the province. The catch of lobsters was 3,574,700 pounds and had a marketed value of \$295,900, slight increases in both instances. There was a catch of 433,700 pounds of haddock with a marketed value of \$7,600, while in the previous year only 8,500 pounds were landed. The herring catch, 34,309,200 pounds, increased by 13,375,600 pounds and its marketed value was \$219,923. There were also increased landings of capelin and clams. Decreased catches of halibut, salmon, smelts and eels were made in the sea fisheries division. In the inland fisheries there were increased landings of carp, catfish, perch, pickerel, pike, salmon, shad, smelts and sturgeon. Of the total marketed value of the fisheries of the province the sea fisheries accounted for \$1,717,148 and the inland fisheries \$589,369. Each of these values was larger than in the year previous, the increases being \$115,678 and \$62,368 respectively.

## ONTARIO

There was an increase in both production and marketed value in Ontario, the former rising by 2,029,400 pounds and the latter by \$128,708. Whitefish, the most valuable species from the monetary point of view, increased in both catch and value, 4,923,000 pounds being landed with a marketed value of \$595,683. Trout catch, 5,295,200 pounds, had a marketed value of \$555,996. Pickerel was slightly greater than in 1933, while the catch of perch practically doubled, but the catch of blue pickerel, 2,432,100 pounds, was little more than half that of the year previous. The pike, sturgeon and tullibee fisheries also showed decreased production catches. The total catch of all kinds was 31,230,600 pounds and the marketed value \$2,218,550.

## MANITOBA

There were 23,459,000 pounds of fish landed from the lakes and rivers of the province during the year, compared with 19,891,300 pounds in 1933. Pickerel was first, both from the standpoint of catch and value, the catch of 8,344,800 pounds representing an increase of 1,447,400 pounds and the marketed value of \$553,504 showing an increase of \$170,851. In the case of whitefish, which ranked second in importance during the year, the catch was 4,896,800 pounds and marketed value \$422,760, in both instances a decrease. The catch of saugers, 4,869,500 pounds with a marketed value of \$242,889, showed an increase of almost 100 per cent in catch and more than 100 per cent in value. There were also



increases in the landings of tullibee, goldeyes, suckers and catfish. The total marketed value of the fisheries output of the province was \$1,465,358, an increase of \$389,222.

## SASKATCHEWAN

Whitefish are the fish taken in largest quantity in Saskatchewan and they range first also in marketed value. In 1934 there were landings of 2,530,500 pounds of whitefish and they had a marketed value of \$162,323. There was a slight drop in the catch but an increase of \$36,670 on the value side. Landings of trout and ling increased, as did the catch of sturgeon, although sturgeon are taken in Alberta in small quantities only. In all the other fisheries of the province, catches decreased. The total quantity of fish landed during the year was 4,038,300 pounds and it had a marketed value of \$219,772.

## ALBERTA

There were increased catches of nearly all kinds of Alberta fish during the year and a corresponding increase in the marketed value. The total catch was 4,036,400 pounds with a marketed value of \$245,405, or some \$100,000 more than in 1933. The catch of whitefish came first, 1,780,000 pounds having been landed with a marketed value of \$148,364. Pickerel and pike were next in order of importance, the landings being 946,500 pounds and 768,700 pounds, respectively.

## BRITISH COLUMBIA

Reference to the year's operations in British Columbia will be found on page 12 under the heading "Pacific Coast Fisheries."

## YUKON TERRITORY

Salmon is the chief commercial fish taken in the waters of the Yukon, though several other species are caught. Total marketed value for 1934 was \$14,625.

## ATLANTIC COAST SEA FISHERIES RESULTS

There were considerably more sea fish landed on the Atlantic coast than in 1933 as will be seen from the following table:—

	1934	1933
	lbs.	lbs.
Nova Scotia.....	238,003,300	215,521,700
New Brunswick.....	135,258,700	129,301,000
Prince Edward Island.....	23,326,200	22,347,300
Quebec.....	98,188,400	84,478,600
Total Landings.....	494,776,600	451,648,600

*Cod, Haddock, Hake and Cusk, and Pollock.*—The total landings of these varieties was 238,853,200 pounds, as compared with 205,577,600 pounds, while the marketed value of \$4,712,375 represents an increase of more than one million dollars. Nova Scotia showed substantial increases in the catch of each species and so did Prince Edward Island, except in the case of pollock, which are not caught off that province. Quebec had increased cod and haddock catches. In New Brunswick the only increase was in the catch of pollock. Total landings for the coast were: cod, 170,124,800 pounds, haddock 35,606,800 pounds, hake and cusk 24,617,900 pounds, and pollock 8,503,700 pounds.



*Herring, Mackerel and Sardines.*—While there was an increase in the total landings of these varieties, the gain was mainly in the sardine catch in New Brunswick and the herring catch of Quebec, although there was a slight increase in New Brunswick's mackerel production. The total landings of the three species were 161,743,600 pounds, with a marketed value of \$2,497,526, while in 1933 there was a catch of 146,943,900 pounds landed and marketed value of \$1,870,846. The herring catch of Quebec, 34,309,200 pounds, was increased by 13,375,000 pounds. The sardine catch of New Brunswick was 38,231,000 pounds, an increase of 12,208,000 pounds. (Sardines are landed mostly in New Brunswick, with only a few in Nova Scotia and Quebec.) The bulk of the mackerel catch is landed in Nova Scotia, but here there was a considerable decrease. In New Brunswick the catch of 923,500 pounds showed a decrease of more than 100,000 pounds.

*Flounders, Halibut and Swordfish.*—The catch of flounders 802,000 pounds represents an increase of almost 200,000 pounds. Each of the Atlantic provinces, except Prince Edward Island, helped to make up the gain, although the greater part of the catch is landed in Nova Scotia. Swordfish are landed only in Nova Scotia, and most of the halibut. In both these fisheries there were decreased catches in 1934. Some 1,409,000 pounds of swordfish were taken while the halibut total was 2,547,100 pounds.

*River Spawning Fish.*—The catch of salmon fell off in each of the provinces, leaving the total 3,490,800 pounds less than the 1933 catch by 872,500 pounds. The largest catch is in New Brunswick where 1,858,400 pounds were taken last year. The landings of smelts were 5,777,500 pounds or 1,838,700 pounds less than in 1933. Each of the provinces showed decreased smelt catches. In New Brunswick, where the largest quantity of these fish is taken, the catch of 3,686,800 pounds showed a drop of 1,553,600 pounds. The catch of alewives, 6,969,600 pounds, was less by some 359,000 pounds than in the preceding year, New Brunswick and Nova Scotia both showing decreased production, while the Prince Edward Island catch increased by 160,000 pounds.

*Lobsters.*—The lobster catch showed a drop, 36,199,200 pounds being taken as compared with 37,491,600 pounds in 1933. Its marketed value, however, was \$4,269,764, an increase of \$745,409. The catches in Nova Scotia and Quebec were larger than in the year before, but those for New Brunswick and Prince Edward Island fell off.

In the tables which follow will be found the statistics showing the lobster catch, its marketed value, and the disposal of the catch by provinces for the past three years.

## CATCH

	1934		1933		1932	
	Cwts.	Marketed Value	Cwts.	Marketed Value	Cwts.	Marketed Value
		\$		\$		\$
Nova Scotia.....	184,590	2,487,633	176,858	1,884,715	237,730	2,711,371
New Brunswick.....	65,073	812,045	74,940	830,363	98,722	1,041,845
Prince Edward Island.....	76,582	674,186	91,547	591,801	114,570	750,039
Quebec.....	35,747	295,900	31,571	217,476	32,466	242,056
Totals.....	361,992	4,269,764	374,916	3,524,355	483,488	4,745,311

## SHIPPED IN SHELL

Nova Scotia.....	91,418	1,365,094	84,271	1,087,770	99,527	1,418,178
New Brunswick.....	22,135	311,446	27,286	348,473	37,777	471,288
Prince Edward Island.....	3,546	38,704	9,568	71,258	3,549	29,277
Quebec.....	5,827	54,273	2,800	25,525	3,630	29,400
Totals.....	122,926	1,769,517	123,925	1,533,026	144,483	1,948,143

## QUANTITY CANNED

Nova Scotia.....	20,553	1,036,487	50,729	754,590	74,060	1,245,654
New Brunswick.....	23,815	477,999	26,417	454,424	35,490	537,991
Prince Edward Island.....	30,214	624,771	32,895	512,138	44,490	711,119
Quebec.....	11,562	241,417	12,021	191,781	12,759	212,656
Totals.....	116,144	2,380,674	122,062	1,912,933	166,799	2,707,420

## TOMALLEY

Nova Scotia.....	3,418	30,951	2,432	18,988	2,624	19,415
New Brunswick.....	479	3,200	236	1,825	190	1,486
Prince Edward Island.....	1,149	9,386	1,032	6,905	939	8,323
Quebec.....	35	210	25	170	.....	.....
Totals.....	5,081	43,747	3,725	27,888	3,753	29,224

## LOBSTER MEAT

Nova Scotia.....	1,077	55,101	602	23,367	506	28,124
New Brunswick.....	388	19,400	553	25,641	751	31,080
Prince Edward Island.....	29	1,325	26	1,500	22	1,320
Quebec.....	.....	.....	.....	.....	.....	.....
Totals.....	1,494	75,826	1,181	50,508	1,279	60,524

*Other Shellfish.*—Clams, oysters, scallops, winkles and mussels are among the other kinds of shellfish landed on the Atlantic coast. Clams are the only species landed in all four provinces and during the year there were 33,676 barrels dug as compared with 25,532 barrels in 1933. Each of the provinces showed an increased clam production with New Brunswick having the largest landings. Increased landings of oysters in Prince Edward Island brought the total for the year ahead of the 1933 figure. There were 21,667 barrels taken, of which 10,160 were landed in Prince Edward Island, as compared with a total of 20,193 barrels in the year before. Out of the total of 44,945 barrels of scallops taken

36,568 barrels were produced in Nova Scotia. Oysters are not taken in Quebec, nor were any scallops landed by Prince Edward Island fishermen last year, although these shellfish occur off some parts of the coast of the province.

### INLAND FISHERIES

There were 71,674,900 pounds of fish taken in the inland waters of Canada, including inland New Brunswick and Quebec, having a marketed value of \$4,769,585. In the previous year the catch was 65,575,300 pounds and the value \$4,063,358. The following table shows the landings of the chief varieties for the past four years:

	1934	1933	1932	1931
	lb.	lb.	lb.	lb.
Whitefish.....	14,461,500	15,213,500	13,847,800	15,785,600
Pickarel (or dore).....	12,251,200	10,627,200	8,949,800	9,182,100
Tullibee.....	4,407,600	4,230,000	4,764,400	4,279,500
Trout.....	5,884,800	5,073,400	5,007,200	7,155,700
Pike.....	3,719,500	4,114,600	4,140,000	5,928,600
Herring.....	3,799,200	3,418,000	3,669,200	5,950,800
Perch.....	7,213,900	4,036,700	6,021,300	5,037,600
Eels.....	2,297,000	2,495,000	1,930,700	1,786,700
Blue pickerel.....	2,432,100	4,216,400	4,061,000	5,404,800
Mullets.....	213,900	236,200	400,000	358,100
Carp.....	2,132,800	1,854,500	1,806,100	1,600,200
Goldeyes.....	330,600	287,600	309,700	350,900

The catch of whitefish, the most important of the inland varieties, fell off somewhat. Manitoba and Ontario are the two provinces where the bulk of these fish are taken and a drop of slightly more than 1,200,000 pounds in the catch for Manitoba was the cause of the net decrease. There was an increase of 200,000 pounds in the Ontario catch. Blue pickerel form an important part of the total production in Ontario, but the 1934 catch showed a large decrease.

In inland Quebec the catch of eels was larger and more valuable than the landings of any other species. Large quantities of eels are shipped alive from Quebec to the markets in the eastern United States, where a good demand exists. The marketed value of shad was the largest single item in inland fisheries production of New Brunswick, with salmon next. Pickerel were landed in sufficient numbers in Manitoba to make them the provincial leader both in catch and marketed value, while whitefish came second. In Saskatchewan whitefish are by far the most important fish, and this is also the case in Alberta. In both provinces the marketed value of the 1934 catch showed increase. The catch of salmon in the Yukon was somewhat less than in 1933.

### PACIFIC COAST FISHERIES

A considerable increase in the catch of salmon and a more normal catch of pilchards off the British Columbia coast made the total Pacific catch and the marketed value much greater than in 1933. The aggregate catch of all species amounted to 365,424,200 pounds having a marketed value of \$15,334,335. In the preceding year the landings were 290,234,500 pounds with a marketed value of \$12,001,471.

*Salmon.*—The catch of 165,990,000 pounds represents an increase of 24,939,600 pounds while the marketed value, \$12,351,641, was greater by \$3,167,551. The pack of canned salmon, 1,582,926 cases, increased by 317,854 cases and the value, \$10,426,160, by \$2,998,037. The packs of chums and pinks form the largest part of the output with sockeye, the most valuable species,



coming third. The pack of cohoes, 195,874 cases, was the largest on record. In addition to the canned fish, almost 17,000,000 pounds of salmon sold were fresh or frozen, 9,098,100 pounds were drysalted, and 3,198,800 pounds of mild cured were prepared for market. The quantity used fresh was somewhat less than in 1933 while in the other two instances the quantities were greater, the mild cured production being almost twice as great as in the year before.

*Halibut.*—The catch by Canadian fishermen was 9,768,100 pounds. Here it should be noted that a change is being made in the method of recording the halibut landings in the statistical report. Hitherto the landings of United States fishing vessels at ports in British Columbia have been included in the totals, both catch and value. Commencing with the 1934 report, only Canadian landings are being included in the main tables and the landings by United States vessels are being shown in a foot note.

The Canadian catch for 1934 compares with 8,324,000 pounds landed by Canadian vessels in 1933. The value of the halibut livers sold during the year was \$36,439, and the point of interest in this connection is that until a few years ago halibut livers were of no value. To-day they are used in making medicinal oil.

*Herring.*—The catch of 82,036,200 pounds was somewhat less than in 1933 when 107,737,300 pounds were landed. The quantity of drysalted being put up, 41,462,600 pounds, was much less than in the previous year when there was a total output of 51,302,400 pounds. The aggregate marketed value of the herring production was 628,982, as compared with \$738,522 in the year before.

*Pilchards.*—The catch was 86,010,300 pounds having a marketed value of \$549,910, compared with landings of 6,535,300 pounds and marketed value of \$77,464 in 1933. While the catch was not nearly so large as in some other years it was nearer normal than in the previous year, when the fish were inexplicably scarce. The production of meal and oil is the chief use to which the pilchard catch is put. Some 1,635,000 gallons of oil and 7,600 tons of meal were manufactured during the year.

*Other fisheries.*—The catch of grey cod, 1,281,100 pounds, was more than double that of the year previous while the landings of ling cod, 4,780,600 pounds, show an increase of more than 750,000 pounds. There were 555,800 pounds of crabs landed, and 3,297 barrels of oysters, small increases in each instance. The number of whales taken was 350 while only 209 were captured in 1933. The products of the whale fishery, whale oil, meal and fertilizer, had a marketed value of 183,738, an increase of \$73,708.

## FISHERIES FOREIGN TRADE

Improvement which made itself apparent in Canada's fisheries export trade in 1933, after several years of large successive decreases induced by the dislocation of economic conditions throughout the world, was again evident during the past calendar year. Sales in 1934 increased by \$2,280,000, in round figures, as compared with a gain of only \$1,470,000 in 1933 and a decrease of more than \$6,000,000 in each of the three years before that. Export total for 1934 was \$22,486,900, in round figures.

Considered by itself, the 1934 betterment is encouraging. It becomes much more impressive, however, when viewed in the light of figures which show how sharp a reversal in a disastrous trade trend it represents and when it is remembered that since 1932 the improvement has been progressive.

As is well known, Canada's fisheries resources are so extensive and the production from them is so large that the fishing industry of the country must

depend mainly upon export channels as outlets for its products. In 1929, when the economic upheaval had not yet made itself generally and seriously felt, the industry's exports amounted in value to \$37,437,000. (This total, like other annual totals given here, includes the value of exports of fish meal and oil, which in some trade reports are shown separately from other products of the fisheries.) By 1930, however, market conditions had become more or less chaotic, prices had fallen to low levels, there were exchange difficulties. The result was that export sales for the year showed a decrease of almost \$6,600,000. There was another decrease of more than \$6,000,000 in 1931 and a third, also over \$6,000,000, in 1932. In the latter year the business done was only \$18,736,000, or half of what it had been in 1929.

In the earlier half of 1933 the trend continued to be downward. Then, in the middle of the year, the situation changed completely, and with surprising suddenness. The trend was definitely reversed. For the year as a whole, as already noted, there was a gain of nearly \$1,500,000, as compared with a decrease of four times that amount, and more, in each of the three preceding years. Recovery was under way, and recovery has been continuing. The latest figures given in this comment are those covering export value for the calendar year 1934—as pointed out before, they show a greater gain than was made in 1933—but it may be added that reports for the first three months of 1935 show a larger business than was done in the corresponding quarter of last year.

Import trade figures for 1934 also testify that recovery is proceeding and that Canadian purchasing power is again increasing. The Dominion's import business in fisheries products is very much smaller, of course, than the export trade—about a tenth as great in terms of dollars and cents—but during the past year it increased by about \$420,000, amounting in all to \$2,025,000, roundly stated. The total fisheries foreign trade for the year, export and import business combined, was thus approximately \$2,700,000 greater than in 1933 or \$24,511,000 as against \$21,809,000.

The largest single item on the import side of the account for 1934 was the purchase of canned sardines from Europe, principally from Norway. In value, the sardine importations amounted to \$287,000. Cod liver oil from Norway and Newfoundland, \$203,800, and oysters from the United States, \$182,000, were the other major imports.

One of the more noteworthy facts in connection with the year's business was that more than half of the total gain in export trade, or \$1,165,900 out of \$2,280,000, was in the dealings with the United Kingdom. The chief factor in this British increase was a betterment of almost a million dollars in the purchases of canned salmon, which amounted in all to more than \$3,262,000. Exports of frozen halibut to the British market also rose sharply, increasing from 3,007 hundredweights to 15,582 hundredweights in quantity and from \$28,000 to more than \$147,000. Although the total export trade with the United Kingdom increased handsomely, the United States continued to be the Dominion's biggest single customer for fisheries products, making purchases of nearly \$9,280,000 during the year as against British purchases of something more than \$5,537,000. At the same time, the gain in the business with the United States was less than half as large as the gain in the business with Britain, or less than \$489,000.

Taking export trade as a whole, the year's sales of canned and preserved fish and shellfish amounted to \$9,130,000; the exports of fresh and frozen fish were valued at \$7,921,000; and the sales of dried, smoked, and salted fish had a total value of \$4,422,000. (In all cases round figures have been given.) There was an increase in each of the three classifications—\$988,000 in the first, \$428,000 in the second, and \$420,000. Export trade in fisheries by-products also showed improvement; the sales of fish meal, \$486,000, were greater by \$197,000 and more than in the preceding year and the sales of fish oils jumped from \$34,395 to slightly more than \$176,000. The United Kingdom was the best customer for meal while the biggest business in oil was with the Netherlands.



The largest single item of increase was in the trade in canned salmon—a gain of over \$636,000. As already stated, the canned salmon exports to the United Kingdom were nearly \$1,000,000 greater in value than in 1933, and sales to Australia increased by \$150,000. On the other hand, purchases by France decreased by \$360,000 and United States purchases by \$220,000. Total business in canned lobsters was a little better than in the year before, so far as value return was concerned, although in this case, as in the case of canned salmon, the volume decreased in some measure.

Over forty-eight per cent of the year's trade in the various kinds of canned fish and shellfish, reckoned in money, was with the United Kingdom, but, on the other hand, and naturally, by far the greater part of the export traffic in fresh and frozen fish was with the United States. Out of the aggregate business of \$7,921,000 in fresh and frozen fish, including shellfish, more than \$7,023,000 was represented by shipments sent across the border.

In the case of dried, smoked, and pickled or salted products, slightly less than half the total business, or \$1,965,000 out of \$4,422,000 was in dried cod. The United States and Italy were the largest buyers of this commodity.

### INSTRUCTIONAL WORK

It is part of the duty of the department's fisheries inspectors to give information and advice to fishermen as to the best methods of handling and processing the catches which are taken (and the officers have been equipped for this work by special courses of study at stations of the Biological Board) but for several years past the department has made annual arrangements whereby other educational service has also been made available in various fishing communities. The policy of carrying on this special instructional work was continued during the past year, and a review of what was done will be found in Appendix No. 4. It will be seen from that review that lectures dealing mainly with points of importance in connection with halibut fishing operations were given to fishermen at Prince Rupert by members of the staff of the Pacific Fisheries Experimental Station and, on the Atlantic coast, another of the annual courses for fishermen was given at the Fisheries Experimental station at Halifax. In numerous Atlantic fishing settlements expert instructors sent out by the department demonstrated the most efficient method of pickle-curing codfish and putting up boneless fish. In the Magdalen Islands, Quebec, and in Gloucester county, New Brunswick, other special instructors employed by the department demonstrated what is known as the "Gaspé cure" method of preparing dried codfish and gave further assistance to the fishermen by supervising operations in which the men applied, in actual production, the knowledge obtained from the demonstrations. It is the intention to carry on once more in the coming year all of these various educational activities, and, in addition, it is proposed to make arrangements under which lectures on appropriate subjects will be given at selected fishing centres in the southern part of British Columbia by members of the Biological Board's staff.

While all of the educational work done during the past few years has quite clearly been of value to the fishermen, and has helped to raise the standards of fisheries production, attention may be directed particularly to the usefulness of the program of instruction in pickle-curing and the processing of boneless fish on different parts of the Atlantic coast. First, by way of explanation, it may be pointed out that while pickle-curing and the manufacture of boneless fish had been carried on most efficiently in various Atlantic areas for many years there were other districts where, for various reasons, operations of this kind were not undertaken prior to the time when the department first put demonstrators into the field in 1929. In still other areas the production processes had not kept pace with modern practice. In undertaking an educational program the



department had in mind both the improvement of the quality of the pickle-cured cod and boneless fish put up in these latter areas, so that the fishermen might find readier sale for their output and obtain higher prices for it, and the opening of new outlets for catches made by fishermen on parts of the coast where pickle-curing had not been carried on.

The first step taken was to examine the situation in Prince Edward Island where, at that time, little or no boneless fish was being manufactured and where sales of pickle-cured cod had fallen because the production was not up to the standard required by the importers in Massachusetts, a big market for cod in this form. Fishermen in different settlements were shown the most efficient methods of curing. Their interest was keen and they applied their new knowledge most intelligently. The result was that as early as the second season of demonstrations a Massachusetts company, which had previously refused Prince Edward Island pickle-cured cod, placed large orders in the province—one of them an order for twenty carloads—and paid higher prices than had been obtainable by the fishermen in the preceding year. Successful efforts were also made by the field officer in charge of the work to encourage men in various provincial districts to go into the production of boneless fish. As a consequence, the island ceased to be dependent upon outside sources for its supplies of boneless fish and the local producers were able to market their output at prices which yielded satisfactory return. In subsequent seasons instruction in pickle-curing was given in Prince Edward Island areas which had not been reached at the outset and further stimulation was given to boneless fish manufacture. The net result has been increased sales and increased returns to the producers, who, in, addition to receiving instruction and advice from the demonstrators, were also assisted in getting in touch with buyers outside the province.

Following the beginning of the work in Prince Edward Island attention was given to eastern Nova Scotia. Western Nova Scotia had long been an important producer both of pickle-cured cod and boneless fish, but the situation was different in the eastern counties, where the fishermen were not familiar with the better methods of pickle-curing cod and where boneless fish was not put up on a large scale. Instructional work similar to that undertaken in Prince Edward Island was therefore begun in Cape Breton and, later, was extended to a number of mainland districts. Ground was first broken on the eastern coast of Cape Breton where, at that time, the larger buyers of pickle-cured cod were making no purchases. Improved methods of handling and curing were soon adopted in different settlements. As a result, buyers came into the field and they have continued to purchase all the pickle-cured cod which the fishermen have had to offer. As time went on, further development work was done in Cape Breton—more pickle-curing was undertaken by the fishermen at different places and at several points the manufacture of boneless cod was taken up successfully. At several Cape Breton points expanded operations are planned for the coming season by those who have seen that quality production means readier marketing and the top prices.

One of the most interesting incidents in connection with the whole program of instruction occurred at one of the fishing settlements on the eastern mainland of Nova Scotia. For years one local firm had purchased and marketed practically all of the fish produced at this village and in nearby areas, but it had been overtaken by difficulty and the managers had been forced to a decision to cease dealing in codfish. This decision meant that the fishermen of the district would be unable to sell the cod which they might catch, for no other buyer was in prospect. The situation was a critical one for the men and their dependents. At this time one of the large Massachusetts importing companies, which was familiar with the results of the department's instructional work elsewhere, was approached by the officer in charge of the demonstrations. As a consequence, the company placed an order in the district for 600,000 pounds of pickle-cured

cod on condition that the fish was prepared in accordance with the method taught by the instructors. The situation was saved for the fishermen and their families.

Elsewhere on the eastern mainland coast where pickle-curing was taken up as a result of the department's educational campaign, the fishermen have found that they can obtain sale for all of their output. In some cases, of course, the outputs have reached only comparatively modest figures, as figures are reckoned in the fishing industry, but the production has brought the fishermen greater return than would have been obtainable if the pickle curing operations had not been taken up. As a matter of fact, the quality of pickle-cured cod now put up in eastern Nova Scotia is so satisfactory that the price obtainable for the fish has risen to the level existing in the western part of the province, where prices were formerly higher. In this connection it is interesting, and gratifying, to note further that the success of the instructors in bringing about quality production in eastern districts has been so striking that leading firms in some of the western counties have asked that the men be sent into their territory during the coming year, especially for the purpose of giving the fishermen the benefit of their expert knowledge regarding the manufacture of boneless fish and packaged fish.

### INSPECTION OF PLANTS AND PRODUCTS

Reference to the work done during the year in inspecting fish processing plants and other products will be found in more or less detail in Appendix No. 4 of this report. It will be sufficient here to summarize the records, and to draw attention to the small percentage of the products which failed to measure up to inspection standards.

Under the Fish Inspection Act, which applies to fish curing plants, certain pickled, drysalted, and smoked fish, fresh oysters, and the containers in which the products are marketed, more than 515,600 packages and boxes of fish were inspected in addition to nearly 82,500 containers. All of these inspections were made by fisheries inspectors on the permanent staff of the department who have qualified by special courses of study to perform such duties. These officers, of course, also carried out regular inspections of the curing plants.

On the Pacific coast 107,567 boxes of drysalted herring, (400 pounds to the box), were inspected. It is only in British Columbia that herring are put up in this form in Canada and the entire annual output is designed for export to the Orient. In recent years the inspection regulations applicable to drysalted herring have been made somewhat stricter than they were formerly and the standard of the pack has been raised accordingly.

Pickled and smoked products inspected on the Atlantic coast were, as follows:—

---

Smoked round herring.....	319,541 boxes
Pickled mackerel.....	41,652 packages
Pickled herring.....	20,843 packages
Fresh oysters.....	19,565 packages
Pickled alewives.....	6,596 packages

---

Containers inspected on the Atlantic coast numbered 82,436.

It will be seen that more than 408,000 packages and containers were inspected in Atlantic areas, and of this large number only 1,397 were found to be below inspection requirements. The products rejected included 706 packages of pickled mackerel, 70 packages of pickled herring, 58 boxes of smoked herring and 16 packages of oysters. Containers which did not pass inspection numbered 547. These figures show at once, of course, that the rejections were equal to less than one-half of one per cent of the total number of articles inspected.



The fisheries product of first importance inspected under the Meat and Canned Foods Act is British Columbia canned salmon. In this case inspection has not been carried on by the department's regular officers, but by a board of canned salmon experts appointed for this purpose by order-in-council and under the law all canned salmon put up in the province must be submitted for inspection before it is shipped to market. During the year which closed at the end of March, the board passed upon 1,550,700 cases. Of this number only 1,152 were rejected, and, therefore, confiscated. The number of cases which were found to be entitled to the board's certificate of approval was 1,521,751, while 26,017 cases fell slightly below certificate standard, but were nevertheless sound, wholesome and fit for human food. Included in the total inspections were 1,780 cases of what are known as "tips and tails" and for "tips and tails" no certificate is issued under the inspection regulations.

On the Atlantic coast during the past few years the work of major importance under the Meat and Canned Foods Act has been the standardization of lobster canneries in order to establish higher standards of construction and equipment and operating conditions and methods. Much progress has been made in this regard, and the work is being steadily carried forward. Particular attention was also given by the inspecting officers during the canning season to test the weights of lobster meat packed in the various sized cans so that the interests of consumers might be thoroughly protected.

## FISH CULTURE

During 1934 the department operated twenty-four fish hatcheries, eleven subsidiary hatcheries, and nine salmon retaining ponds, as well as several egg collecting camps. The total output of eggs, fry, etc., from these establishments was 89,261,999. Detailed figures, and a complete report on the year's fish culture operations, will be found in Appendix No. 3 of this volume.

The department's fish cultural work is carried on in Nova Scotia, New Brunswick, and Prince Edward Island, in the east, and in British Columbia, in the west. In addition, however, the operations of two hatcheries and one sub-hatchery in the National Parks in Alberta, are directed by this department, but at the expense of the National Parks branch of the Department of the Interior, and these three establishments and their output are included in the figures given in the preceding paragraph.

In the Maritime Provinces the department's operations include the propagation and distribution of the more important species of freshwater and anadromous fishes such as Atlantic and sebago salmon, speckled trout, rainbow trout, and Loch Leven trout. In the west it is concerned with propagating and distributing such fish as sockeye, spring, coho, Atlantic, Kennerly's, and steelhead salmon, and Kamloops, cutthroat, rainbow, and speckled trout, Loch Leven or brown trout, and salmon trout.

## EXPANDING OYSTER CULTIVATION

A very interesting part of this report will be found in Appendix No. 6, which recounts, in condensed form, some of the earlier steps taken by the department to develop further the Prince Edward Island oyster industry and describes the work done in this connection during 1934.

It may be recalled that this particular development program followed upon an agreement made in 1928 between the Dominion and the Provincial authorities which ended the divided jurisdiction over Prince Edward Island's oyster resources and placed complete control in the department's hands. A condition of the agreement was that the department should take whatever steps



it might find necessary and feasible to expand the oyster industry, and in the light of certain investigations which were made it was decided that development could best be hastened by encouraging oyster "farming" upon areas approved by the department as suitable for operations of this kind and made available to private interests for leasing. Experimental farming was undertaken by the department itself in the Malpeque Bay district in order to serve the threefold purpose of developing oyster cultivation methods suitable to provincial conditions, demonstrating these methods for the guidance of persons taking up oyster production on leased areas, and providing stock which might be used in establishing farms in other provincial waters.

As the appendix relates, ninety-eight leased areas have been brought under cultivation by oyster farmers since the department's policy was made effective. In 1932, the year when the first leases were completed, the number of cultivated areas was twenty-six. By the end of 1933 the number had slightly more than doubled. In 1934 there was another increase of forty-three, bringing the total almost to one hundred, as already indicated. Included in the leases taken out last year were two covering areas in districts where farming had not previously been attempted, and as further evidence that extension of operations is likely to be a continuing process for some time to come it may be pointed out that leases are being sought for ground in still other districts where cultivation has not hitherto been undertaken.

In the nature of things it requires some time for the results of a program of this kind to become fully apparent. Several years are needed to prepare and stock an area and bring it to the stage at which it will annually produce a substantial quantity of market-sized oysters. What has already been accomplished, however, very definitely supports the belief that the action the department has been taking will lead to a large increase in the island's output in the course of the next few years. Reference to the appendix will show that last year 460 barrels of oysters were marketed from the leased areas and 422 barrels from the areas which the department is cultivating. It will be noticed, too, that in addition to the market-sized oysters, there were available from the departmental farm several hundred barrels of small oysters which were sold to the holders of leased areas for stocking purposes. It is also interesting to note, as evidencing the soundness of the cultivation methods which have been developed, that the quantity of spat (baby oysters) obtained in the department's 1934 operations was larger than it would be possible to handle to advantage in the forthcoming season and many thousands of them were sold to leased area operators at cost.

So far as the leased farms are concerned, attention may likewise be drawn to the fact that the lessees are working diligently and intelligently to make their grounds increasingly productive as the years go by. It will be seen by glancing at the table given in the appendix that the farmers have been concentrating upon the task of improving their areas and increasing the oyster stocks upon them, with a view to building up future production, rather than upon the possibility of making present profit from sales. Or, as the appendix itself puts it, "the bona fide attempt of the lessees to establish their oyster farms properly is shown by the small quantities of oysters marketed as compared with the quantities of oysters and of spat and cultch planted. (See table). In numerous cases large quantities of oysters are available for sale but have been left on the grounds to promote further reproduction. It is clearly shown that the lessees are planning for development in the future. Great care is being taken not to jeopardize the breeding stock."

## PACIFIC COAST SCALLOP DRAGGING

In an effort to ascertain whether or not scallops are present in commercial quantities off British Columbia, exploratory draggings were undertaken by the department during the year, both in northern waters and off the southern portion

of Vancouver island, but the number of scallops found was small. However, representations have been made by provincial fisheries interests that further investigations should be made and the question of having more dragging done in the coming autumn will be given consideration.

The first of the 1934 operations were conducted off the northern part of the Queen Charlotte islands, and at several points on the east side of Hecate strait, by the departmental vessel *Givenchy*, which used a drag made on the Atlantic coast where there is a fairly large scallop fishery. The dragging in these northern waters was done in late August and in September while, in November, the *Givenchy* tried out the possibilities of several areas to the south of Nanaimo. In the north, some scallops were found at various places such as McIntyre bay, Naden harbour, Refuge bay, Oval bay, and Qlawdzeet anchorage but no large quantities were located. In the southern areas the best results, so far as numbers of scallops went, were obtained at Percy anchorage, near Dodd narrows, where four draggings brought up 132 specimens but all of small size. Larger scallops were found off Chemainus and in Plumper sound but not in substantial quantities.

### BIOLOGICAL BOARD RESEARCH

Work done by the Biological Board of Canada, which, under the control of the Minister of Fisheries, carries on federal fisheries research in the Dominion and is in effect the scientific division of the department, includes some studies of the habits and life history of fish and shellfish but it will be seen by referring to Appendix No. 2 of this report that the place of paramount importance is given to efforts to further fisheries development by means of investigations and experiments in connection with practical problems of the fishing industry. The solution of such problems, says the chairman of the board, has become "the whole object of our fulltime staff" and while a very small proportion of the board's funds is used to pay the expenses of volunteer summer workers "the policy of the board demands that almost all their work shall be on problems designed to assist the fishing interests—marine and freshwater." It is not necessary to review here the achievements of the staffs of the board's research centres in dealing with the problems which have come before them in connection with handling and processing fish and shellfish and manufacturing fisheries by-products. Reference is made to a number of them in the appendix. Others are discussed in various papers which the board has published and made available for distribution to interested persons. For purposes of illustration, however, mention may be made of the very valuable work done in demonstrating practical uses of fish oils and thus opening new outlets for Canadian producers, to the development of successful methods of oyster farming which are referred to elsewhere in this report, and to the determination of correct conditions for the freezing and cold storage of fish. In all of these instances, and in others which might be cited, the board's investigations and experiments have been of direct and positive benefit to the fishing industry and, what is more, will continue to be of benefit. Fisheries research and experimentation have been receiving increasing attention of late years, not only in Canada but in every other country possessing important fisheries resources. It is gratifying to be able to say that, proportionate to the funds available, Canada has been accomplishing in this field at least as much as other nations. In methods and results, Canadian fisheries research workers are doing credit to themselves and are rendering most valuable aid to fisheries development.



## EXPANDING DEMAND FOR FISH FOODS

The program of fish cookery demonstrations, coupled with addresses on the value of fish foods, which the department has been carrying on since 1931, was continued during most of the fiscal year but toward the year's close the work was halted by the death of Mrs. Evelene Spencer, the expert official by whom it had been conducted. Mrs. Spencer's death brought many expressions of regret. She was a woman of quite exceptional qualifications and her services since she joined the department's staff had brought high praise from the fishing industry and warm appreciation from housewives in different parts of the country.

The past year's work was done, for the most part, in Montreal and Toronto. It was centred in those cities because it is there that the Dominion's greatest concentrations of population are found and because in each of them opportunities opened up of reaching hospitals and residential educational institutions which are large consumers of food. Any action which leads institutions in these two groups to make greater use of fish and shellfish must be an effective factor in expanding the demand for the fishermen's products. There is the further point to be kept in mind that at girls' schools it is possible to emphasize to large numbers of young people who, in a few years, will have become housewives the importance of including fish foods regularly in the family diet. It was because of the department's appreciation of the importance of this field that Mrs. Spencer gave a good deal of time to it. It was time well spent. The results, of course, were not all immediate. There will be continuing results. At the same time, it may be added that in a number of instances the institutions at which demonstrations and addresses were given at once increased their purchases of fish.

The question as to what action may be taken regarding the continuation of the program is now under consideration. There can be no doubt as to the usefulness of efficient effort of this kind. That is established by the experience of the past few years. Nevertheless, the conduct of such a program is not the simple matter which it might appear to be from casual observation and therefore careful consideration is being given the question as to future action.

## LOBSTER TRANSPORTATION SERVICE TO UNITED STATES

During the 1934 lobster fishing season in eastern Nova Scotia the subsidized transportation service, instituted through departmental action several years ago for the purpose of enabling the fishermen of that area to enter the live lobster market of the United States under satisfactory conditions, was again in operation and between April 20th and July 24th a total of 10,366 crates, holding 1,464,350 pounds of live lobsters, were carried by sea to Boston and Gloucester, Massachusetts. Five boats were used in the service, although not five continuously. Each boat made only such trips as were required to meet the traffic needs. As in 1933, the ports of call were St. Peters, Petit de Grat, and Arichat, in Cape Breton, and, on the mainland, Queensport, Canso, Dover, Whitehead, Port Felix, Coddles Harbour, Fisherman's Harbour, and Drum Head. Catches taken by the fishermen of these settlements were carried to market by the transportation boats and at a number of the ports shipments were also made by lobstermen from nearby points. In addition, the shipments from St. Peters and Arichat included some quantities of lobsters brought to those places by a collection service conducted by a private operator along the east coast of Cape Breton.

Out of the total quantity of lobsters carried by the subsidized service, during the season, only 63,000 pounds, in round figures, or something more than four per cent, were found unfit for sale on their arrival in the United States. The percentage was small but, nevertheless, it was a little greater than in 1933 and



the point should again be emphasized that shippers of live lobsters should take every care to see that their shipments are in sound condition when started on their way to market. As was said in the last departmental report in a reference to this subject, the fact cannot be too strongly stressed that fishermen must ship only lobsters which are in first class condition if they hope to obtain the maximum return in dollars and cents. Shippers who follow any other course are inviting loss.

In making reference to the quantity of lobsters which were condemned as unfit for sale on their arrival at the New England ports acknowledgment should be made of the courtesy of the Supervisor of Marine Fisheries for the Commonwealth of Massachusetts in forwarding information regularly to the department as to the condition of the cargoes. The supervisor kept the department informed regarding the quantity of lobsters condemned on arrival and the general condition of each shipment. Through his good offices the department was also advised as to the daily temperatures in the holds of the carrying boats on their trips to the Massachusetts ports. Each boat was equipped with a temperature recording device and when a run ended at Boston or Gloucester the daily readings for the trip were taken off by a representative of the supervisor and sent to Ottawa. In this way there was a continual check upon temperature conditions. It is essential, of course, that the temperature in the hold of any vessel carrying live lobsters should be kept at proper level.

The subsidized service has now been in operation since 1930. It has accomplished the double purpose of demonstrating that it is feasible to operate a satisfactory transportation service between eastern Nova Scotia and the United States, the big market for live lobsters, and of increasing greatly the returns to the lobster fishermen. Prior to 1930 the lobstermen in the eastern part of Nova Scotia were unable to ship live lobsters to the United States under anything like satisfactory conditions. Suitable transportation facilities were not available. Under these circumstances the fishermen on that section of the coast had restricted outlet for their catch. Practically all of their landings had to be used for canning. They did not have the opportunity that was open to their fellows in various other areas of engaging in the profitable live lobster trade on any large scale. The service changed the situation.

In the first year, when shipping live lobsters was a new venture for many of the fishermen of the district, the shipments carried by the boats of the service amounted to slightly less than 570,000 pounds. In 1931 there was an increase to 999,375 pounds. The following year saw a further increase of more than sixty per cent and the total weight of lobsters carried was 1,623,210 pounds. That was the peak year. In the next season there was a slight drop. In 1934, when, as already stated, the lobsters handled by the boats had an aggregate weight of 1,464,350 pounds, there was another decrease but, even at that, the shipments were nearly 160 per cent greater than they had been during the first year that the service was in operation. All told, in the 5-year period, 1930-34, the boats of the service carried 6,262,000 pounds of lobsters to Boston and Gloucester. In other words, the existence of the service opened to the fishermen an additional outlet for this large portion of their catch and increased their earnings very substantially.

Events have fully justified the department's action in bringing about the establishment of the shipping service and ensuring its continuance until development of the live lobster business in the area concerned had passed the experimental stage. The fishermen of the different settlements have been given an excellent start in the business. They have been shown its possibilities and requirements. At the same time, it has been demonstrated that substantial traffic is obtainable by boats undertaking to transport the lobsters to market, and it is understood that at least one service of the kind will be operated by private interests during the coming season. It is not the intention, therefore,

to continue the departmental subsidy. To assist the fishermen in entering the live lobster trade, from which they had virtually been barred by the conditions formerly existing, and to demonstrate the feasibility of the necessary transportation service, were proper departmental objectives but once these purposes have been accomplished, of course, the case is one which is reasonably to be left to private initiative and energy.

*Packet Service.*—For several years past the department has granted a subsidy to a schooner packet service between L'Ardoise, in Cape Breton, and the port of Halifax, and the subsidy was renewed for the 1934 shipping season. Unless some such service were available to them, the fishermen of L'Ardoise district would lack adequate facilities for shipping their catches to market or bringing in supplies, and it is for this reason that the departmental subsidy has been given.

### FISHERIES INTELLIGENCE

Collection of statistics of commercial operations in all fisheries which are under federal administration is a very important part of the intelligence work carried on by the department and during the past year, as in previous years, much time was necessarily given to it by the staff of the branch concerned. Monthly and annual statistics of operations in British Columbia, Nova Scotia, New Brunswick, Prince Edward Island, and the Magdalen Islands in Quebec, and such special data as may be required from time to time, are collected by the department's fisheries inspectors in these areas and are checked and studied at headquarters in Ottawa. In the case of the sea fisheries of the mainland portion of Quebec, which are administered by the province, the figures are gathered by provincial officers but are sent to this department since they are not only of local interest but are essential to any compilation showing the results of Canadian sea fishing operations as a whole. Yukon statistics are collected for the department by officers of the Royal Canadian Mounted Police on duty in that territory, but they are made up on a yearly basis only. It may be added, incidentally, that as the inland fisheries of Quebec, Ontario, Manitoba, Saskatchewan and Alberta are not administered by the Dominion, but by the respective provinces, the collection of statistical data of these fisheries is done by provincial authorities in each instance.

Monthly compilations of all the sea fisheries returns are made by the department and summarized reports based upon them are published in the departmental Fisheries News Bulletin from month to month. In this way information as to the progress of the sea fishing industry is made regularly available to the public. In the case of the annual statistics, checking is done by the department but compilation is carried out by the Dominion Bureau of Statistics, which includes among its yearly publications a statistical report on Dominion fisheries. In the preparation of this report the bureau has the collaboration of this department and of the several provincial departments which have to do with fisheries matters.

Under arrangements made by the department, radio broadcasts giving weather forecasts and information as to the stocks of bait and ice on hand at different ports were continued during the year for the benefit of Atlantic coast fishermen. The weather reports—prepared by the Dominion Meteorological Service—were broadcast twice daily throughout the year from Louisburg, N.S., Halifax, N.S., and St. John, N.B. The reports as to bait and ice supplies were made up at the department's Halifax office from information obtained each day by telegraph from fisheries inspectors at various points in Nova Scotia and the Magdalen Islands and were sent out regularly from the Halifax and Louisburg stations during those months when a service of this kind would be helpful to the fishermen. It was also possible, through the co-operation of the Newfoundland authorities, to add to a number of the broadcasts information as to the



quantities of bait obtainable at certain Newfoundland ports. All of the messages from the stations which were sent out during the time that the departmental ship *Arras* was on the banks with the Nova Scotia fishing fleet were rebroadcast from this vessel. It may be added that a broadcasting service of this kind is not required on the Pacific coast where the conditions under which the fishermen operate are different from those in Atlantic areas.

In the departmental report for 1933-34 reference was made to the large number of requests which had been received for information regarding fisheries matters. During the past year the number of such requests was, if anything, rather greater than before. Popular interest in the fisheries and their development is apparently increasing, and a condition of this kind is, of course, a cause for satisfaction. As in the earlier year, most of the requests received during 1934-35 were for general information but there were numerous inquiries touching technical questions.

### FUR SEAL RETURNS

Monies received by the Dominion during the fiscal year under the Pelagic Sealing Treaty made up the sum of \$89,549.74. This amount was greater by slightly more than \$37,000 than the receipts of the year before.

The largest item, \$75,108.85, in the 1934-35 receipts was made up of the proceeds from the sale of fur seal skins delivered to Canada by the United States under the terms of the treaty and shipped to London by the Dominion for marketing. The treaty provides, among other things, that Canada shall be entitled to fifteen per cent, in number and value, of the annual United States take of skins on the Pribilof Islands but under the practice followed for a number of years the Dominion, instead of requiring that the skins themselves be delivered, took its share in the form of fifteen per cent, of the cash return from the sale of the skins by the United States authorities at St. Louis, Missouri, a centre of the trade in furs. In 1933, however, the Dominion decided to market its share of the year's Pribilof skins in London. Steps were taken accordingly, and the results achieved were such as to lead to a continuation of the same course of action during the past year. In each year some of the skins were sold in the salted or unfinished condition and others after they had been dressed and dyed in Great Britain. The experience of the two years has been such as to indicate that a satisfactory London market can be built up for skins of both classes.

In addition to the money derived from the London sales the 1934-35 receipts included \$1,293.52 paid by the Government of Japan and \$13,147.37 received from the United States Government. The payments by Japan represented the Canadian share (ten per cent) of the net proceeds from the sale of 1,701 skins taken in 1931 on Japanese areas covered by the treaty and 1,700 skins taken on those areas in 1932. The sum paid by the United States was the Dominion's share of the returns, from sales made during the year of Pribilof skins taken prior to 1933.

*Sealing in British Columbia Waters.*—In the course of the year 256 seals were captured off British Columbia by Indians of the province. (Under the Pelagic Sealing Treaty the hunting of fur seals in British Columbia waters may be engaged in only by Indians of the province.) The number taken was much less than in 1933, but this condition was largely due to the fact that the price offered for skins taken by Indians was very low—approximately \$2, on the average.

### FISHING BOUNTY

Under authority of "An Act to Encourage the Development of Sea Fisheries and the Building of Fishing Vessels," 12,623 fishing bounty claims on behalf of persons engaged in the sea fisheries of the four Atlantic provinces were paid during the year, the outlays totalling \$159,976.25. The payments were shared by



21,917 boat fishermen, 12,006 boat owners, 3,339 vessel fishermen and 617 vessel owners. In the preceding year the number of claims was 12,836 and payments totalled \$159,311.35. The scale of payments to individual fishermen in the 1934 season was slightly higher than in 1933, although in the case of boat and vessel owners there was no change in the scales, and this explains how it was that the total amount paid in bounty during the later year showed some increase over the 1933 total notwithstanding that fewer claims were paid.

The payments to boat owners and boat fishermen during the past year aggregated \$127,059.25, while the bounties received by vessel fishermen and vessel owners amounted in all to \$32,917. The basis of distribution among persons entitled to receive bounty in 1934 was as follows: To owners of vessels, \$1 per registered ton, payment to the owner of any one vessel not to exceed \$80; to vessel fishermen, \$6.20 each; to owners of boats measuring not less than twelve feet keel, \$1 per boat; to boat fishermen, \$5.25 each. By provinces, the payments were as follows: Nova Scotia, \$76,538.55; Quebec, \$46,726.90; New Brunswick, \$24,682.70; Prince Edward Island, \$12,028.10.

Details of the year's distribution are shown in the following table:

1934-35

Province and County	Boats	Men	Amount	Vessels	Tons	Average tons	Men	Amount	Total Amount
			\$ cts.					\$ cts.	\$ cts.
NOVA SCOTIA—									
Annapolis.....	181	299	1,750 75	1	16	16	6	53 20	1,803 95
Antigonish.....	165	253	1,493 25						1,493 25
Cape Breton.....	381	726	4,184 00	24	373	15	85	900 00	5,084 00
Cumberland.....	5	5	31 25						31 25
Digby.....	437	822	4,752 50	2	29	14	10	91 00	4,843 50
Guysboro.....	685	1,120	6,565 00	27	343	13	100	968 00	7,533 00
Halifax.....	912	1,308	7,779 00	47	583	12	173	1,655 60	9,434 60
Inverness.....	235	493	2,823 25	5	55	11	22	191 40	3,014 65
Kings.....	78	110	655 50						655 50
Lunenburg.....	626	868	5,183 00	99	4,205	42	1,097	11,006 40	16,189 40
Pictou.....	24	38	223 25						223 25
Queens.....	188	326	1,903 00	11	150	14	56	497 20	2,400 20
Richmond.....	518	1,009	5,815 25	2	28	14	9	83 80	5,899 05
Shelburne.....	794	1,396	8,123 00	26	671	25	234	2,121 80	10,244 80
Victoria.....	417	624	3,693 00	14	206	14	57	559 40	4,252 40
Yarmouth.....	155	383	2,165 75	11	396	36	141	1,270 00	3,435 75
Totals.....	5,801	9,780	57,140 75	269	7,060	26	1,990	19,397 80	76,538 55
NEW BRUNSWICK—									
Charlotte.....	266	558	3,193 05	2	28	14	7	71 40	3,264 45
Gloucester.....	532	1,144	6,538 00	213	3,635	17	932	9,413 40	15,951 40
Kent.....	206	383	2,216 75	9	98	10	21	228 20	2,444 95
Northumberland.....	58	123	703 75	69	783	11	165	1,804 50	2,508 25
Restigouche.....	19	31	181 75						181 75
St. John.....	32	43	257 65						257 65
Westmoreland.....	6	13	74 25						74 25
Totals.....	1,119	2,295	13,165 20	293	4,544	15	1,125	11,517 50	24,682 70
PRINCE EDWARD ISLAND—									
Kings.....	343	484	2,884 00	5	69	14	22	205 30	3,089 30
Prince.....	639	1,248	7,191 50						7,191 50
Queens.....	152	304	1,747 30						1,747 30
Totals.....	1,134	2,036	11,822 80	5	69	14	22	205 30	12,028 10
QUEBEC—									
Bonaventure.....	576	984	5,739 50	10	102	10	32	300 40	6,039 90
Gaspé.....	2,624	5,387	30,905 25	40	442	11	170	1,496 00	32,401 25
Matane.....	151	252	1,474 00						1,474 00
Saguenay.....	601	1,183	6,811 75						6,811 75
Totals.....	3,952	7,806	44,930 50	50	544	10	202	1,796 40	46,726 90
Grand totals....	12,006	21,917	127,059 25	617	12,217	19	3,339	32,917 00	159,976 25

NOTE.—A number of late claims amounting in all to \$1,158.20, which are included in the above statement, are for the season of 1933. As the basis of distribution for 1933 differed from that of 1934 a number of the figures indicated in the "Amount" columns do not balance with the number of claims paid.

## NORTH AMERICAN COUNCIL ON FISHERY INVESTIGATIONS

The 1934 meeting of the North American Council on Fishery Investigations was held on September 19, 20 and 21 on the French Government's new fisheries research vessel, the *Président Théodore Tissier* at Halifax, N.S. This vessel came to Halifax from the Newfoundland banks especially for the meeting, which may be said to have been held technically on French territory. There were five French scientists present, Dr. Edouard LeDanois, Director of the Scientific and Technical Office of the Maritime Fisheries of France, and Commander Beauge, captain of the vessel, both being members of the council, Dr. P. Desbrosses, Dr. G. Belloc and Mr. E. Priol, in charge of the several fishery laboratories in France. Dr. LeDanois described to the council the initial voyage of the *Président Théodore Tissier*, which was launched only a year ago, reporting the discovery of some new fishing banks off the European and Moroccan coasts, and he also told of studies which the French scientists have been making as to fluctuations in the movements of various kinds of fish, particularly cod. Commander Beauge discussed investigations made on the fishing grounds of Newfoundland and Greenland in 1932 and 1933; M. Priol outlined biological studies of the French mackerel which he had made; Dr. Belloc told of fisheries studies carried on in West Indian areas, and Dr. Desbrosses dealt with the tagging and measuring of fish in European waters.

The United States was represented by Dr. H. B. Bigelow, Director of the Woods Hole Oceanographic Institution, who is chairman of the council; Charles E. Jackson, Deputy Commissioner of Fisheries, Washington, D.C., and Elmer Higgins, Chief of the Division of Scientific Inquiries, United States Bureau of Fisheries, Washington, Dr. Harold Thompson, Director of Fisheries Research, Newfoundland, represented that country. The Canadian members of the council, all of them in attendance at Halifax are the undersigned, and Dr. J. P. McMurrich and Dr. A. G. Huntsman, both of them associated with the Biological Board of Canada, which is the federal fisheries research body of the Dominion. Dr. Huntsman is the council secretary. Accompanying the United States and Canadian members were a number of the fisheries investigators of the two countries, who presented outlines of work done on various fisheries problems since the 1933 meeting of the council.

Water conditions—The practical importance to the fishing industry of scientific study of water conditions and movements was emphasized through the meeting and various interesting and important facts were brought out in this connection. Dr. Thompson, in telling of Newfoundland cod investigations, pointed out that it is becoming clear that the availability of cod in the Newfoundland area is conditioned much more by local fluctuations of water temperature than by variations in the relative numbers of year classes. By using a thermometer on the fishing grounds, the Newfoundland research commission's trawler had been enabled to keep in touch with large cod, sometimes finding that only fifteen minutes' steaming from a ground where the large fish were lacking would be sufficient to reach an area where they could be located in numbers. Dr. Thompson also stated that in the past three years the southern ledge of Grand Bank, which is frequented by trawlers, was more productive in 1932, when the bottom temperature was 3° Centigrade or lower, than in either of the other years. In 1934, with the temperature on the ledge averaging nearly 6° C., only small cod were plentiful. In this connection it may be noted, too, that feeding tests made by R. A. McKenzie, one of the Canadian investigators, in the course of a study of the cod populations in the Halifax area, has revealed that, as a rule, large cod (fish measuring 70 centimeters and over) will die when the water temperature rises to between 13 and 16° C., although small cod will survive and eat at still higher temperatures.



H. B. Hachey, another Canadian investigator, in telling of hydrological studies between Shelburne and Canso, N.S., during the past year, drew attention to sharp and erratic changes in salinity and temperature which occur in bottom waters inshore and he went on to state that it has been fairly well established that the distribution of atmospheric pressure over the North American Atlantic water is closely related to these changes, which, of course, affect the movements of fish. When atmospheric pressure on the coast is high, in comparison with that of the open ocean, there is a "piling" of surface layer waters toward the shore, he said, and a consequent removal of waters of the lower layers. On the other hand, when the atmospheric pressure gradient is in the opposite direction—low pressure on the coast and high pressure over the open ocean—the surface layer waters are removed from the coast and there is an inrush of replacing waters from the lower levels.

*Effect of currents on spawning.*—A probable relationship between trends in Georges bank currents and the occurrence of poor year classes of haddock was suggested by facts brought out by W. C. Herrington in reviewing some of the haddock investigations which he has been conducting for the United States Bureau of Fisheries. Georges, of course, has long had a foremost place in the haddock fishery and is the location of important spawning grounds and much attention has naturally been paid to it by investigators. By using drift bottles it was found out that in certain years the current shows a drift off the bank, and it has also been found that in some of these same years the year classes of haddock have been relatively small. A positive conclusion as to the significance of these coincidences is perhaps not yet possible, but they suggest that in years when the current sets strongly off the bank a good deal of the spawn is swept off the haddock spawning grounds and reproduction is diminished.

A point of incidental interest regarding Georges bank was cited by C. O. Iselin, of the Woods Hole Oceanographic Institution, when he said that dredging done on the sides of the steep canyons on the south side of the bank has disclosed evidence supporting the theory that Georges is in reality a very old topographical feature and that the glacial deposits on its top are only superficial. Mr. Iselin also stated, in telling of various water studies which he has been carrying on, that his investigations have led him to believe that the influence of what he classified as "Mediterranean water" is not only apparent on this side of the ocean but that it can be traced all the way to Bermuda.

*Mackerel Stocks.*—In discussing the mackerel fishery, O. E. Sette, who is in charge of mackerel investigations for the United States, pointed out that during the past year additional evidence was obtained that the mackerel population has in it two distinctive types of year classes, one which may be called only "transitory" and the other a "persistent" class or one continuing to be noticeable in the fishery over a period of years. He was able to add the encouraging statement that the evidence so far at hand indicates that the 1933 year class will prove to be an important one, the abundance of yearlings found in 1934 having been substantially above the average. The further point was made, however, that the toll taken in New England waters from young mackerel migrating from the St. Lawrence spawning grounds is very heavy and that some protective action may be necessary.

Speaking of Canadian herring studies Dr. Huntsman reported that since the council's 1933 meeting further confirmation had been obtained of the view that the immature herring of the Passamaquoddy region are distributed in movements of the superficial water, largely through the agency of hydrodynamic forces set up by freshwater inflow. Dr. Huntsman also spoke of Canadian salmon investigations and Dr. Thompson told of some work of the same kind which Newfoundland is undertaking.



One of the other interesting contributions to the meeting was a statement by Dr. Bigelow to the effect that research carried on under the Oceanographic Institution has shown that a certain spindleshaped fungus may be the cause of the diseased condition which has been so pronounced in eel grass along the Atlantic coast during the past two or three years. Some previous work done in this field—both Canada and the United States have been carrying on investigations—had pointed to bacteria as the possible cause of the disease but the most recent Woods Hole study has shown that the fungus in question is constantly associated with the diseased condition of the leaves and stems of the eel grass and that it is found in stricken plants before bacteria. It is a relatively large, mobile fungus, belonging to the lower forms, and moves along the air spaces of the leaves. Incidental to the discussion of the disease and its cause the interesting point was brought out that the destruction of the eel grass in areas where previously the growth had been heavy is having the effect of altering the character of the sea bottom since the disappearance of the grass allows soft mud to be swept away by the action of the water.

*Haddock Fishery.*—Of all the fisheries questions dealt with, the serious situation existing in the haddock fishery was considered the problem of greatest immediate importance. As a result of discussion within the council itself and at sittings of a sub-committee appointed to deal specifically with the haddock case, a joint program of haddock studies will be carried on by Canadian, United States and Newfoundland fisheries scientists as intensively as may be feasible, with United States and Canadian experts taking charge of definite items of research, and exchanging the material which they may obtain, and with Newfoundland lending co-operation by surveying the Grand Bank situation in particular and giving some attention also to the northern boundary of the Western Bank area. It is expected that this program will be continued over a minimum period of five years and at the end of that time the position will be re-examined.

Investigations which have been carried on by the United States and by Canada during the past few years, especially those conducted by the United States, have shown that the haddock fishery off North America is in danger of diminishing alarmingly. Very successful year broods of haddock apparently occur only infrequently. There are indications that there is an insufficient escapement of uninjured immature fish in the course of fishing operations. United States vessels, as shown by United States investigations, are finding their catches growing smaller on the nearer fishing grounds and must apparently go farther afield. These points, as well as others, have been brought out by the work already done by such haddock research men as W. C. Herrington, of the United States, and Dr. V. D. Vladykov and Dr. A. W. H. Needler, of Canada, but present data are not sufficient to establish a basis for determining exactly what conservation action should be taken or how it can best be attempted and the joint effort now being planned will be an endeavour to obtain the further information which is necessary, although, as will be seen by reference to Appendix No. , which gives the sub-committee's report, the council's sub-committee expressed the opinion that wholly adequate attention cannot be given to the problem until a suitable research ship is made available for haddock studies.

#### INTERNATIONAL FISHERIES COMMISSION, 1934-35.

Under authority of the treaty of May, 1930, between Canada and the United States, the International Fisheries Commission continued its investigation and regulation of the Pacific halibut fishery. Its investigations added new facts regarding the fishery and the biology of the species and proved that the year's regulations were successful in continuing the improvement in the condition of the stock.

The fishing season opened on March 1st, one month later than in 1933. The catch limits set by the commission for Areas 2 and 3 were the same as in the previous year. Area 1 was to close at the same time as Area 3, but it became evident that Area 2 would close early and that a heavy fishery would develop in Area 1, so during September a limit of 1,400,000 pounds was announced for Area 1. Due to improved fishing conditions, and despite the later opening date and voluntary curtailment of production by the fishing fleet, the catch limit in Area 2, the grounds off southeastern Alaska, British Columbia, and northern Washington, was reached earlier than in the previous year. Area 2 was closed at midnight of August 19th, at which time the catch amounted to approximately 22,350,000 pounds. Areas 3 and 1 were closed on October 27th, with catches of approximately 23,600,000 and 1,500,000 pounds, respectively.

Efforts of the fishermen to obtain the greatest possible economic benefit from the fish caught, by distributing their landings of halibut more evenly throughout a greater portion of the year, were continued as in the previous year. To this end the whole fleet cooperated voluntarily in a system of curtailment by means of tie-ups and trip limits. The past and current statistics of the fishery were furnished to the fleets by the commission to facilitate this.

As in previous years, the commission maintained close contact with the halibut industry, whose personnel have a standing invitation to visit the commission's laboratory and keep informed of what the commission is doing. Meetings were held with the Conference Board, composed of representatives of all sections of the fishing fleet, and with various individuals and committees. Such matters as the progress of the commission's investigations and their purpose were explained and the difficulties of the fleet were discussed. These contacts have contributed in no small way to the success of the commission.

The scientific investigations of the commission were continued as provided for by the treaty. They include a system of observation of the changes occurring as a result of regulation in order that a sound basis for the intelligent control of the fishery may be provided. The work of the scientific staff was divided between the final analysis of previously collected data, the preparation of reports on these data, and the collection and preliminary analysis of data for the current year. The collection of current biological data made necessary the operation of a vessel.

*Abundance of Fish.*—The abundance of fish, as indicated by the catch in pounds per unit of fishing gear, continued to increase during the year. The average catch per unit of gear in Area 2, which includes the British Columbia coast, amounted to 56.4 pounds, an increase of 8 per cent from the previous year. In Area 3, the other important source of halibut, the catch per unit was increased by 4 per cent to 87.2 pounds. The catch per unit in Areas 2 and 3 was higher by 61 and 35 per cent, respectively, than in 1930, the last year of unrestricted exploitation.

The increase in abundance, produced by the restriction on fishing during the past few years, has been of vital importance to the fishing fleet. Without the increase, individual trips could not have been successful at the prices now prevailing, and the resultant economic conditions would have caused the tie-up of a large portion of the fleet during 1933 and 1934. This would have been particularly true of the boats operating in Area 2. Moreover, the ease with which "trips" can now be secured prevents long absences and consequent poor quality.

A report upon the effect of changes in the intensity of fishing upon the total yield of the fishery and upon the yield per unit of fishing effort was published during the year. The report discusses the basic principles underlying the reactions of stocks of fish to varying intensities of fishing and analyzes the changes which have occurred in the halibut stock in the past and which are occurring at present under regulation. It demonstrates that the intensity of the



fishery is the major factor in the changes which have occurred, and that by regulation of intensity the commission can control the size of the stock on the grounds and the number of fish allowed to reach spawning age, without marked reduction of the total catch.

The report shows how, off the coasts of British Columbia and southeastern Alaska, a reduction in the intensity of fishing will not only allow a greater number of fish to reach maturity and produce a greater number of young but will actually produce a greater poundage from the same number of young. It explains how, with less effort, the fleet is able to make the same total catch. It gives good reason for the hope that the total yield can in time be increased without danger to the future of the fishery and with benefit to the fishermen and public of both nations.

The history of the fishery and the age at which young fish enter the fishery indicate that the increased abundance to date cannot be due to a greater supply of young fish. It can only be explained by the longer life and the resultant growth to larger size of the fish which had already been spawned at the time the restrictions were imposed. This means that an increase in the number of spawners, and consequently in the amount of spawn produced, should already be under way.

*Measurement System.*—The importance of proving these changes in the sizes of fish has led to the inauguration of a system of market measurements of the fish landed by the commercial fleet to supplement the studies already made of the market categories. Approximately 35,000 and 50,000 halibut from all grounds were measured in 1933 and 1934, respectively. The results of these measurements show a definite increase from 1934 to 1935 in the average size of the fish caught in Area 2. This corroborates the explanation of the increase in abundance which was made earlier by the commission on theoretical grounds. It is expected, as a result of this increase in proportion of older fish, that in due time the income of young fish spawned by these older fish will also increase, which should be reflected in the young fish landed. The market measurements must therefore be regarded as essential to proof of the favourable results of regulation.

Since conclusive proof of improved spawning conditions can only be obtained by an actual measurement of the changes, the commission is now developing a system of observation of the production of spawn. Each of the past four years, the commission has chartered vessels to operate silk nets for the capture of eggs and larvae in order to determine their distribution and abundance. Early work, during which the method of sampling was being developed, proved that spawning was plentiful on western grounds and very scarce on the intensely fished southern grounds, so that the effect of the fishery on the abundance of spawn can hardly be questioned. It also proved that spawn from the western grounds does not reach and cannot help to maintain the southern stock, so that the latter must provide its own. Later work, with improved technique, has been directed at the more accurate measurement of the abundance of spawn, particularly off the coast of British Columbia. This accurate measurement necessitates a precise knowledge of where, at what level, and at what time the eggs are to be found.

Analysis during the past year of the results of net hauls for eggs and larvae in British Columbia waters in January and March, 1934, showed the capture of a greater number of eggs and larvae than in the three preceding years. The greater abundance of eggs and larvae may indicate an increase in the production of spawn, but so great has been the advance in accuracy of operations that the present results are difficult to compare with the earlier. The increase, if it is finally proved to be real, is in agreement with the conclusions indicated above. Increased spawning is a first step in the rehabilitation of the



fishery, though its effect will not be apparent in the fishery for six years, the time required for the young produced to enter the commercial fishery in any numbers, even as small fish.

*Spawning off British Columbia.*—Toward the end of the year the investigation of spawning in British Columbia waters was continued. The United States halibut schooner *Paragon* was chartered and operated in the neighbourhood of the Queen Charlotte islands from the beginning of December to the end of February. Numerous net hauls were made to determine more accurately the vertical distribution of the eggs and larvae and their drift and to demonstrate clearly any change in their abundance. Advantage was taken of the opportunity to liberate drift bottles for the study of the ocean currents affecting the distribution of young. The results of a preliminary field examination of the material taken in the net hauls around the Queen Charlotte islands during the early part of the spawning season suggest that the abundance of eggs and larvae this year was greater than last. The final decision regarding the 1934-35 spawning must, however, await the sorting and final analysis of the net hauls for the entire season.

During the latter part of the year particular attention was given to the analysis of the results of the study of eggs and larvae. By the end of the year reports dealing with the description of eggs and larvae, their distribution and abundance were practically completed.

By the events of the last few years as well as by analysis of the history of the fishery, the commission has demonstrated its control over the stock of fish on the grounds and over the spawning stock. It is now confronted with the task of determining to what extent this stock must be increased in order that sufficient spawn may be provided to populate the banks properly. The commission is confident it can solve this problem, as it has the others which have arisen in the past.

Your obedient servant,

WM. A. FOUND,

*Deputy Minister of Fisheries.*

## APPENDIX No. I

### ANNUAL REPORTS OF CHIEF SUPERVISORS OF FISHERIES FOR THE YEAR 1934

#### REPORT OF MAJOR D. H. SUTHERLAND, CHIEF SUPERVISOR OF FISHERIES, EASTERN DIVISION

There was a distinct improvement in marketing conditions during the year as compared with the two previous years and while the industry has by no means returned to normal it is satisfactory to note an increase in marketed value for the division, which is made up of the three Maritime Provinces and the Magdalen Islands, of approximately two and one half million dollars over the 1933 figures. This was due to a greatly reduced carry-over in some of the chief export products from the previous year, and a keener demand, together with more favourable exchange rates and an increase in total landings of about 32,000,000 pounds. These conditions were to some extent reflected in the returns received by the fishermen who benefited by an increase in landed values of over one and one-half million dollars.

The total catch landed during the year was 422,570,400 pounds with a landed value of \$7,592,457 as compared with 390,760,400 pounds with a landed value of \$5,764,115 for the previous year.

The total annual marketed value of all fish and shellfish landed throughout the division during the past six years was as follows:—

1934.....	\$ 12,793,713
1933.....	10,266,474
1932.....	10,914,306
1931.....	13,680,034
1930.....	17,026,070
1929.....	19,334,431

The fisheries of each of the three Maritime Provinces and the Magdalen Islands show an increase in catch as well as in landed and marketed values. The lobster was again the most valuable product and accounts for over a third of the total value of the fisheries for the year. It ranked first in each province, excepting New Brunswick where it was superseded by the sardine fishery which was most successful. In fact, one of the outstanding features of the year's operation was the tremendous increase of over 15,000,000 pounds in the sardine catch, with corresponding increases in landed and marketed values.

#### THE LOBSTER FISHERY

The total catch for the year was 35,658,800 pounds or a decrease of 1,353,300 pounds as compared with 1933. There were sharp increases, however, in both landed and marketed values \$895,187 in one case and \$850,117 in the other, due largely to a higher price range for lobsters of the canning size and for the canned product.

Pronounced decreases are noted in New Brunswick and Prince Edward Island catches while there were substantial increases both in Nova Scotia and the Magdalen Islands.

The following table shows the catch, pack, shell shipments, and tomalley pack together with values for each province:

## CATCH

	1934		1933		1932	
	Cwt.	Marketed Value	Cwt.	Marketed Value	Cwt.	Marketed Value
		\$		\$		\$
Nova Scotia.....	184,590	2,390,841	176,858	1,884,715	237,730	2,711,371
New Brunswick.....	65,073	858,499	74,940	830,363	98,722	1,041,845
Prince Edward Island.....	76,582	795,553	91,547	591,801	114,570	750,039
Magdalen Islands.....	30,343	287,648	26,776	175,545	27,499	200,986
Totals.....	356,588	4,332,541	370,121	3,482,424	478,521	4,704,241

## SHELL SHIPMENTS

	1934		1933		1932	
	Cwt.	Marketed Value	Cwt.	Marketed Value	Cwt.	Marketed Value
		\$		\$		\$
Nova Scotia.....	93,298	1,334,081	84,271	1,087,770	99,527	1,418,178
New Brunswick.....	26,166	350,454	27,286	348,473	37,777	471,288
Prince Edward Island.....	16,007	160,070	9,568	71,258	3,549	29,277
Magdalen Islands.....	9,015	77,717	589	3,611	2,300	18,400
Totals.....	144,486	1,922,322	121,714	1,511,112	143,153	1,937,143

## QUANTITY CANNED

	1934		1933		1932	
	Cases	Marketed Value	Cases	Marketed Value	Cases	Marketed Value
Nova Scotia.....	50,565 <sup>3</sup> / <sub>4</sub>	1,033,887	50,729	754,590	74,060	1,245,654
New Brunswick.....	23,816 <sup>1</sup> / <sub>4</sub>	485,364	26,417	454,424	35,490	537,991
Prince Edward Island.....	30,215	624,772	32,895	512,138	44,490	711,119
Magdalen Islands.....	10,096	209,907	10,730	171,914	10,941	182,586
Totals.....	114,693 <sup>1</sup> / <sub>2</sub>	2,353,930	120,771	1,893,066	164,981	2,677,350

## TOMALLEY

	1934		1933		1932	
	Cases	Marketed Value	Cases	Marketed Value	Cases	Marketed Value
Nova Scotia.....	3,326 <sup>1</sup> / <sub>2</sub>	30,281	2,432	18,988	2,624	19,415
New Brunswick.....	480	3,281	236	1,825	190	1,486
Prince Edward Island.....	1,150	9,386	1,032	6,905	939	8,323
Magdalen Islands.....	4	24	4	20	.....	.....
Totals.....	4,960 <sup>1</sup> / <sub>2</sub>	42,972	3,704	27,738	3,753	29,224

## THE COD FISHERY

Increased cod catches were made in all parts of the division with the exception of New Brunswick. The catch there fell off about 950,000 pounds owing to smaller landings from the inshore grounds on the northeast coast. The catch on the bay of Fundy was somewhat greater than that of the previous year.



For Nova Scotia there was an increase in the catch of over 11,000,000 pounds. This was due largely to greater landings in the western part of the province, but there was a general increase throughout the province.

A total catch of 123,580,000 pounds was taken in the division with a landed value of \$1,473,457 compared with a catch of 112,255,000 pounds in 1933 valued to the fishermen at \$1,084,625. The total market value was \$2,380,977 as compared with \$1,802,026 for the previous year, or a substantial increase of \$578,951. Conditions in the cod fishery were somewhat more satisfactory, and the catch and value greater, than for the past three years, but when it is realized that the catch for Nova Scotia alone in 1926 was over 180,000,000 pounds valued at \$4,500,000 it will be seen that this fishery has a long way to come back.

#### THE HADDOCK FISHERY

A slight decrease of 408,500 pounds is noted in the haddock landings. This fishery is almost entirely confined to Nova Scotia. Of the total 1934 catch of 26,478,600 pounds, 25,390,100 pounds were landed in that province. The total landed and marketed values were \$459,959 and \$914,685, respectively, as compared with \$331,277 and \$832,009 during the previous year. Heavier landings in western Nova Scotia, due to a greater number of powered vessels being employed in the fresh fishing industry, account for an increase there of over 3,000,000 pounds. Fish classified as scrod, which include haddock under two and one-half pounds, show a heavy increase in the eastern mainland district of about 4,000,000 pounds. This more than offsets the slight decrease in haddock for the division as a whole.

#### THE HERRING FISHERY

New Brunswick is the largest herring producing province in the division and accounted for more than half the total catch for the year.

The total quantity landed in the division was 77,530,000 pounds with a landed value of \$325,228 as compared with 82,649,600 pounds, valued to the fishermen at \$317,421. The marketed value was \$845,841 as compared with \$776,686. Of the total catch New Brunswick contributed over 42,000,000 pounds, of which 18,000,000 pounds were produced on the bay of Fundy coast—a considerable increase over the previous year. There was a good demand on the bay coast for smoking herring at satisfactory prices, particularly on Grand Manan, where there was great improvement in the smoked herring industry. A large quantity of herring was used in canning kippered herring, ovals and kippered snacks. The value of the herring industry on the bay of Fundy coast of New Brunswick was about \$330,000 out of a total marketed value for the whole division of \$845,841. On the east coast of New Brunswick, where the herring are mostly used for bait and hard smoking, the catch was 24,000,000 pounds with a marketed value of \$146,000, a considerable decrease both in quantity and value as compared with the figures for the previous year.

In Nova Scotia, while the catch was slightly less than in the previous year, there were increases in the landed and marketed values, but in Prince Edward Island both catch and values fell off. In the Magdalen Islands, where herring usually first appear and are largely used as bait and for hard smoking, the catch increased about 1,500,000 pounds, with corresponding increases in landed and marketed values.

There was a good demand for bait herring, particularly in southwestern Nova Scotia, but owing to low prices there was little incentive for the fishermen to catch fat herring for salting, although these fish were abundant on the coast.

## THE SMELT FISHERY

Of the total catch of smelts for the division, 5,227,300 pounds, New Brunswick contributed 3,686,800 pounds, although there was a decrease for that province of 1,557,600 pounds as compared with the previous year's catch. The New Brunswick fishery is almost entirely confined to the east and north coasts and is probably the largest on the continent, the wide estuaries of the Restigouche and Miramichi rivers producing the bulk of the catch. In a peak year the value of the New Brunswick fishery approximates \$1,000,000. The marketed value there for 1934, however, was only \$420,064, but the figures represented an increase of about \$100,000, notwithstanding the decreased catch. Early season operations were hampered by running ice but later fishing was most satisfactory, with prices averaging ten cents per pound.

On Prince Edward Island and in Nova Scotia the catch was somewhat smaller than that for the previous year, while in the Magdalen Islands, where a fine large type of smelt is produced during a necessarily short season, the catch increased about 6,000 pounds and value by over \$2,000.

The catch of the whole division shows a decrease of 1,709,400 pounds but an increase of \$52,029 in landed and \$96,498 in marketed values as compared with 1933. The total marketed value for 1934 was \$529,016.

## THE MACKEREL FISHERY

The bulk of the mackerel catch was produced in Nova Scotia, the Magdalen Islands being the next heaviest producing area. A total catch of 18,974,200 pounds was taken in the division, compared with 26,234,600 pounds during the preceding year. There was a much more satisfactory market for salt mackerel but prices in the year before were so extremely low that fishermen were discouraged at the beginning of the 1934 season from operating on a large scale, and this, rather than scarcity of fish, accounts for the reduced catch. The landed and marketed values, \$217,024 and \$429,307, respectively, as compared with \$211,740 and \$394,215, also reflect a much higher price range than that obtained during 1933.

The New Brunswick mackerel catch was 920,700 pounds, slightly less than the 1933 production. In Prince Edward Island 823,800 pounds were taken, as compared with 925,500 pounds. While the Magdalen Islands produced only 2,778,000 pounds, as compared with 3,526,000 pounds, the marketed value there was slightly more than for 1933. In Nova Scotia 14,378,200 pounds were taken, as compared with 20,970,600 pounds, but the marketed value was \$342,282 against \$306,049. Decrease in catch was general throughout Nova Scotia but more noticeable in the eastern mainland district, where the heaviest catches were taken the previous year.

## THE SALMON FISHERY

The catch of salmon was 2,538,900 pounds with a landed value of \$285,112 and a marketed value of \$397,053 as compared with 3,100,500 pounds landed value of \$308,194, and marketed value of \$400,604 for 1933. The decrease is largely due to a decline in the catch in New Brunswick where the quantity produced was 1,922,100 pounds as compared with 2,261,300 pounds. In Nova Scotia the catch decreased on the island of Cape Breton and on the eastern mainland but a slight increase was shown in the southwestern section.



## THE HALIBUT FISHERY

Practically the entire landings of halibut are made in Nova Scotia. Out of the total catch for the division, 2,489,500 pounds, 2,454,300 pounds were landed in that province. The total catch shows a decrease of 319,800 pounds compared with 1933, and there were corresponding decreases in landed and marketed values. The total marketed value for 1934 was \$286,692.

Southwestern Nova Scotia is the heaviest producing district and accounts for about two-thirds of the catch. This is due to the landings of powered vessels from halibut trips at the fishing ports there.

## THE SWORDFISH INDUSTRY

This fishery is entirely confined to the Nova Scotia coast and by far the heaviest catches are taken off the east coast of Cape Breton, although scattered catches are taken all along the Atlantic coast of the province. The catch for the year totalled 1,409,100 pounds. Landed value was \$117,607 and marketed value \$174,559. In 1933 the catch was 1,713,700 pounds with a landed value of \$117,602 and a marketed value of \$208,038. It will be noted that the 1934 catch was considerably less than in the year before but greater than the average catch for the four years previous to 1933. Cape Breton produced 1,256,400 pounds or about 90 per cent of the total catch. The fish appeared earlier than usual on the coast, the first being taken at Neil's harbour on July 24th, but seemed to keep farther off the coast than usual throughout the season. Unfavourable fishing weather during the latter part of the season greatly hampered operations and many boats did not earn enough to pay expenses. The average price was eight cents per pound as compared with six and three-quarter cents in the previous year.

## THE SCALLOP FISHERY

An increase of 4,390 gallons (shelled) is shown in scallop landings for the division. The total quantity landed was 89,854 gallons (shelled) with a landed value of \$166,699 and a marketed value of \$168,638 as compared with 85,464 gallons (shelled), landed value of \$159,958 and marketed value of \$160,410 for 1933. Scallop fishermen in Nova Scotia fared well, the total catch showing an increase of 11,636 gallons (shelled), but the New Brunswick men were less fortunate, their catch falling off about one-third. The extra-territorial waters off Digby county produced the bulk of the Nova Scotia catch, 24,342 gallons (shelled), valued to the fisherman at \$95,743, as compared with 21,762 gallons (shelled), valued to the fisherman at \$84,976, in 1933.

## THE OYSTER FISHERY

The total production of oysters in the division was 4,333,400 pounds, which is equivalent to 21,667 barrels. The landed value was \$81,865 and marketed value \$119,319. In 1933 production was approximately 20,200 barrels valued to the fisherman at \$70,112 and marketed at \$100,863.

Prince Edward Island was the heaviest producer in 1934 and the catch there increased from 1,328,600 pounds to a total of 2,032,000. There was a good demand for oysters during October and November in the Upper Canadian market, but, later, the market became oversupplied and it was difficult to dispose of the increased catch at satisfactory prices. However, about ninety per cent of the catch sold at higher prices than in 1933. The oyster development work undertaken by the department in Prince Edward Island some years ago is showing very satisfactory results, and the local supervisor reports that during the year a considerable quantity of oysters were taken from private beds in Richmond



bay and shipped to the Upper Canadian market where prices higher than the average were obtained. These oysters were of select quality, and it is anticipated that there will be a large quantity of oysters shipped from private beds during the 1935 season and the supply will keep increasing from year to year as development goes on. Public beds in Hillsboro river and its tributaries, Vernon, Seal and Orwell rivers, are well stocked with small oysters and should yield a satisfactory catch during the coming season.

In New Brunswick there was a catch decrease of 377,800 pounds with a landed value decrease of \$2,342. The district supervisor reports that oysters did not attain satisfactory growth during the year, and as the size limit regulations were strictly enforced the catch dropped considerably.

In Nova Scotia, where oysters are only produced in Cape Breton island and along the northern coast of the province, the provincial catch fell off slightly, due to a drop of about 500 barrels along the Northumberland Strait areas. In Cape Breton, where oysters are taken from the areas in Bras d'Or lake, there was an increase of about 350 barrels. Satisfactory marketing contacts were made in the Montreal and local markets. The quality of oysters from these areas has greatly improved during recent years as a result of more careful culling and packing.

#### CLAMS AND QUAHAUGS

The total quantity of clams and quahaugs taken in the division was 6,460,700 pounds valued to the fishermen at \$36,803 and marketed at \$82,933. In landings there was an increase over the 1933 production of about 1,500,000 pounds with corresponding gains in values. The Bay of Fundy section of New Brunswick accounts for most of the increase, and in that district 14,700 barrels were taken as compared with only 9,000 barrels during 1933. The increase was due entirely to a more satisfactory demand for canned clams, and the Charlotte county canneries put up larger packs than during recent preceding years. As usual, a considerable quantity of raw clams was exported to the state of Maine from the Charlotte county areas.

In Nova Scotia the bulk of the clam production is taken from areas in Yarmouth and Digby counties and shipped in the raw state to the Boston market. About 8,528 barrels were landed in this district during the year as compared with 6,880 barrels during the previous year.

#### THE SARDINE FISHERY

Sardine fishing is confined to the Bay of Fundy coast of New Brunswick and is prosecuted most intensively in Charlotte county. The catch during 1934 was 41,458,200 pounds, equivalent to 207,291 barrels—the highest on record since 1929. The landed value was \$291,358 and the marketed value \$1,087,674, which makes the sardine the most valuable fishery in New Brunswick for the year. The increase in the catch over landings for the previous year was 15,435,800 pounds with increases in landed and marketed values of \$178,130 and \$465,143 respectively.

#### OTHER FISHERIES

There was a substantial increase, 3,000,000 pounds, in the catch of pollock, with corresponding increases in landed and marketed values. Nova Scotia is responsible for most of the increase, particularly the southwestern district where the increase was about 2,000,000 pounds, but increases are also noted in the western mainland and in Charlotte county, New Brunswick. There was also a heavy increase in hake and cusk landings, 24,542,200 pounds being taken as compared with 17,749,300 pounds during the previous year. The marketed value of the fish was \$257,930 as compared with \$149,166. There was a slight

increase in Prince Edward Island production but the catch in New Brunswick fell off about 500,000 pounds, due to reduced catches in the Bay of Fundy section. The catch on the east coast of New Brunswick shows a slight increase. The southwestern district of Nova Scotia, particularly the Digby Neck shore, is responsible for the large total net increase. In this district 13,943,300 pounds of hake and cusk were taken as compared with 8,413,700 pounds in the previous year.

The increases in the quantities of hake, cusk and pollock landed were due to more satisfactory marketing conditions. During the year there was a much better demand for both green salted and dried products than in the past few years.

NOVA SCOTIA

The total quantity of fish landed in Nova Scotia during 1934 was 238,107,-900 pounds, with a landed value of \$4,628,375, as compared with total landings during the previous year of 215,519,000 pounds and a landed value of \$3,405,210. The marketed value of the 1934 catch was \$7,491,400 as compared with \$5,798,-809 in 1933.

The table given below shows, by species, the results of the chief commercial fisheries during the year as compared with the previous year:

1934

Total quantity of all fish landed, lbs.....	238, 107, 900
Landed value.....\$	4, 628, 375
Marketed value.....\$	7, 491, 400

	Lbs.	Landed	Marketed
		\$	\$
Lobsters.....	18, 459, 000	1, 821, 459	2, 461, 784
Cod.....	97, 802, 700	1, 217, 408	1, 956, 545
Haddock.....	25, 390, 100	440, 044	888, 725
Mackerel.....	14, 378, 200	173, 301	342, 282
Herring.....	19, 467, 800	125, 316	311, 837
Halibut.....	2, 454, 300	216, 254	283, 512
Hake and Cusk.....	15, 360, 000	67, 681	178, 991
Swordfish.....	1, 409, 100	117, 607	174, 559
Scallops (shelled)..... gals.	73, 136	136, 030	137, 385
Salmon.....	604, 800	70, 192	108, 478
Pollock.....	5, 930, 300	32, 779	98, 581
Smelts.....	622, 100	40, 968	61, 140

1933

Total quantity of all fish landed, lbs.....	215, 519, 000
Landed value.....\$	3, 405, 210
Marketed value.....\$	5, 798, 809

	Lbs.	Landed	Marketed
		\$	\$
Lobsters.....	17, 685, 800	1, 223, 980	1, 884, 715
Cod.....	86, 603, 300	852, 643	1, 442, 599
Haddock.....	25, 495, 400	313, 881	799, 218
Mackerel.....	20, 970, 600	171, 125	306, 049
Herring.....	20, 149, 500	119, 017	290, 803
Halibut.....	2, 790, 000	220, 988	287, 547
Hake and Cusk.....	8, 822, 900	26, 821	84, 032
Swordfish.....	1, 713, 700	117, 602	208, 038
Scallops (shelled)..... gals.	61, 500	118, 813	119, 265
Salmon.....	824, 500	82, 938	111, 066
Pollock.....	3, 324, 900	13, 311	31, 523
Smelts.....	682, 800	44, 382	66, 558



It will be noted that while increased landings are shown for only four varieties, namely lobsters, cod, hake and cusk, and pollock, increased landed and marketed values, both are fairly general and lesser values than those of 1933 are only shown in the case of halibut, swordfish, salmon and smelts, which also show decreases in the quantities taken. Satisfactory increases are noted both in quantity and value for the lobster and cod fisheries.

The lobster catch for the province for the past six years has been as follows:—

1934.....	18,459,000
1933.....	17,685,800
1932.....	23,773,000
1931.....	22,364,900
1930.....	20,820,100

These figures indicate that this fishery is being well maintained notwithstanding the more intensive fishing operations which have been carried on during the past four or five years.

A general increase is shown in cod landings. A slight decrease is shown in haddock catch, due to smaller landings in Halifax west. A fair increase in haddock is shown, however, on the southwestern section of the mainland and also on Cape Breton island. A decline is noted in mackerel landings as compared with 1933, when there was an exceptionally large run, but comparing the catch with the average for the ten years previous to 1933 there is a large increase for 1934. The catch of herring was slightly below that of 1933, due to smaller landings on Cape Breton and in the eastern part of the mainland. A general decrease is shown in halibut landings.

#### SPORT FISHING

During the 1934 season natural conditions throughout the province were most unfavourable for good angling, owing to the quick spring run-off and the dry period setting in a good deal earlier than usual. Very little rain fell from the middle of May until the latter part of September or early October and, consequently, water conditions in the rivers and streams were abnormally low and there was little attraction for salmon to enter rivers excepting those where normal flow was maintained by storage developments. With these conditions satisfactory angling for salmon could not be expected, but it is gratifying to note, nevertheless, that fair catches were taken on some of the best angling rivers. In October there was heavy precipitation, and during the latter part of that month and in November the rivers rose to freshet level and there was no doubt a good deal of interference with natural spawning. Trout fishing was quite satisfactory throughout the province during the early part of the season.

#### ANGLING IN CAPE BRETON ISLAND

Water conditions were not favourable for fishing as very little rain fell from the middle of May until the end of September and the water was low during the intervening period. Only 144 salmon were landed on the Margaree river as compared with 470 during 1933. This was the smallest catch taken on the Margaree within the recollection of the oldest residents. Most of the salmon were small in size, averaging from eight to twelve pounds. The best fishing was enjoyed during the second week of October, when several large fish were landed. Only three salmon were landed on Little river, as compared with 116 in 1933. There were none hooked in June, which is usually the best month for fishing in this stream. On North river, St. Ann's, the number of salmon caught was ninety-five, as compared with seventy-four in 1933. Salmon entered the river about the first of June and the first fish was caught on June 5th. The largest fish landed weighed twenty-six pounds. On Grand river only six salmon were landed as compared with nineteen in 1933.



Good catches of trout were made in the lower part of the Margaree in June and July and at the headwaters in August. The number caught during the season was 4,433, an increase of 1,196 over the 1933 figures. On North river, St. Ann's, and also on Grand river, the catch shows a decrease. At or near tidal waters in the streams between Inverness and Port Hawkesbury the catch was the largest in recent years, and the fish were of excellent size. During May good catches were landed at lake Ainslie. In the district from Little Narrows to Indian brook, Victoria county, the best catches landed were as follows:—

Washabuck river.....	543 lbs.
Barrasois river.....	510 "
Middle river.....	371 "

Fishing in North Aspy river was poor because of low water conditions and dredging operations at the outlet. Fairly good catches were landed in Middle Aspy river early in July. Satisfactory catches were taken in Clyburn's brook and Ingonish river during the last three weeks in July and the first two weeks of August.

*Eastern Mainland.*—Generally, angling for salmon was not as good as in 1933. The number taken decreased in all streams. The best angling was in Osier, Ingram, Musquodoboit, Ship Harbour, West river Sheet Harbour, Port Dufferin and Moser rivers in Halifax county. In Guysboro county the catch for the past three years has been as follows:—

	1934	1933	1932
St. Mary's river.....	64	127	104
Gaspereau brook.....	8	12	8
Ecum Secum river.....	51	32	35
Country Harbour river.....		3	5
Liscomb river.....	6	14	15
	129	188	167

Angling for trout was considerably better than in 1933. Improved conditions were reported from all districts, with larger catches. The low water period from about the middle of June was general, with no sport fish being taken.

Rainbow trout fishing in Giant's lake was opened during the year, and on the first day of July some 120 anglers fished in this lake. Fish taken during the first six weeks were in poor condition, the largest reported weighing five and one-half pounds. The total number taken was about 150.

*Western Mainland.*—The number of salmon taken on the rivers in Lunenburg county was far below the average but this was due to the fact that the dry weather set in so early in the season that the rivers were low, especially the LaHave, and the fish could not ascend and stayed at tidewaters near Bridge-water where large numbers of them could be seen during the summer. The same conditions obtained on the Medway, Petite Riviere, Clyde and Tusket rivers. The Mersey produced more fish on the rod last year than any other river in the province, as water conditions did not affect it. Salmon were reported plentiful in the Clyde river. On the Annapolis river and its tributaries 127 salmon were taken by fly. Bear river had a very good run of fall salmon but owing to the drought few of them were able to reach their spawning grounds and they turned and went elsewhere. The north and south branches of Annapolis river, Walker brook and Fallis stream had a particularly good run of fall salmon.

Trout fishing on the Mersey and Medway was good and some catches of very large fish were landed. In the Kejimikujik lake and river district the best fishing in years occurred.

On the Roseway river better trout fishing was reported than for years past.

In Yarmouth county the catch was about the same as in the previous year. In Digby county trout fishing was good until the month of July. In Lunenburg county fishing was fair.

#### FISHERIES PATROL SERVICE

A change was made in the patrol service in the district during the year by substituting for the two boats formerly owned and operated by the department, the *Thresher* and *Mildred McColl*, two boats of smaller type, fifty feet long, powered with crude oil engines and having a crew of three men each, called the *Venning* and the *Gilbert*. The operation of both these boats has been satisfactory. A considerable saving has been made, as compared with the operating cost of the boats displaced, and there has been better service.

The patrol boat *Gilbert* was placed in commission on May 16th, 1934, and proceeded to Pictou on May 23rd, under command of Captain M. B. Fanning, then going on patrol in Nova Scotia District No. 1. Subsequently, the boat was on duty in various parts of the division.

The *Venning*, commanded by Captain J. P. Williams, was commissioned on April 27th and patrolled in various Nova Scotia and New Brunswick waters.

The chartered boat *Marmat* was employed from May 24th to November 24th continuously in the Strait area for the protection of the lobster fishery and patrolled 5,772 miles.

The *Capelin* (Captain E. H. Lewis) was employed practically throughout the year, with the exception of a slight period when she was undergoing annual overhaul. This boat patrolled the district from Pubnico to the head of the bay of Fundy. Her services were very satisfactory and were no doubt largely instrumental in keeping illegal lobster fishing at a minimum. A total of 6,683 miles was covered by the boat.

The *Halkett* (Captain A. H. Zinck) was laid up at H.M.C. Dockyard, Halifax, on February 3rd, and was recommissioned on April 11th when she resumed patrol duties in the waters of southwestern Nova Scotia in connection with the prevention of illegal lobster fishing generally, as well as the enforcement of the size limit regulations and other duties relating to the protection of the fisheries. The boat was laid up for the season at Lunenburg on December 18th. The mileage covered by the *Halkett* on patrol work was 4,270 miles.

#### FISHERY PROTECTION SERVICE

The fishing protection cruisers, *Arras* and *Arleux*, the former under the command of Captain Clement Barkhouse and the latter under the command of Captain H. P. Cousins, were actively employed in fisheries protection work except during the annual overhaul period, throughout the year and rendered excellent service.

At the beginning of the year the *Arras* was at Yarmouth working with the lobster fishing fleet and engaged in breaking ice in Yarmouth harbour and vicinity in order to make it possible for the vessels to enter and leave. Similar service was also performed during the month of January in Shelburne harbour and other places. Early in January the *Arras* was called upon to take supplies to the fishermen and their families on Seal island, as the weather was so bad boats from Charlottetown harbour could not get to the island. These supplies were landed successfully by the *Arras* as well as another consignment later on. During February and March the ship was actively engaged in southwestern Nova Scotia in ice-breaking and rendering assistance to the fishing fleet, and in April did similar work to the eastward of Halifax. After overhaul the vessel went to the Grand Banks June 20th, with the Lunenburg fleet as a hospital ship. While she was so engaged a great many fishermen were given treatment by the ship's doctor, Harvey Hebb, M.D. While on the banks the *Arras* broadcast weather, bait and ice reports to the fleet daily. After her return from the banks



in early September the ship was engaged in general fisheries protection work. The ship steamed 12,083 marine miles during the year and spent 210 days at sea.

The *Arleux* during January, February and three weeks of March was engaged in ice-breaking at Sheet harbour, Lunenburg, Mahone Bay, Chester, Hubbards, LaHave, Riverport, Queensport, Eastern Passage, Bedford Basin and Shelburne. Vessels were released and shipping assisted generally. After annual overhaul at Lunenburg the ship resumed service in the latter part of April in Northumberland strait in order to prevent any lobster gear being set before the opening of the season and to protect the lobster fishery generally. From then until early in September she was on duty in various areas. During part of September she accompanied Cape Breton swordfish vessels, assisting them in locating fish and also seeing to the protection of the 3-mile limit. Subsequently the *Arleux* did further patrol duty and from November 20th to the end of the year she served as a "mother" ship with the Canso and Petit de Grat winter haddock fishing fleets. The *Arleux* frequently rendered assistance during the year to fishing vessels and other boats in distress and assisted navigation by keeping the harbours open during winter months. The ship steamed 14,347 miles and spent 228 days at sea. In addition, the motor boat belonging to the ship was engaged in inshore patrol work and covered 379 miles.

#### THE LUNENBURG FLEET

The total catch of the Lunenburg fleet during 1934 was 102,000 quintals as compared with 80,900 quintals in 1933. The following table shows the number of vessels engaged and the quantity landed each trip, as compared with 1933:—

1934	Number of Vessels	Catch Quintals
Frozen Baiting.....	17	13,250
Spring.....	26	28,300
Summer.....	31	50,050
Fall.....	1	400
		102,000
1933		
Frozen Baiting.....	15	8,250
Spring.....	24	23,300
Summer.....	26	39,350
Fall.....		
		80,900

The highliner for the season was the *Mavis Barbara* with a total catch of 4,900 quintals.

The results of the Lunenburg fleet's operations for the past six years have been as follows:—

	Vessels	Qtls.	Average per vessel
1934.....	31	102,000	3,290
1933.....	26	80,900	3,111
1932.....	26	72,600	2,769
1931.....	46	94,400	2,052
1930.....	68	142,380	2,091
1929.....	71	208,700	2,939



## LOBSTER TRANSPORTATION SERVICE

The operation of the lobster collection service on the eastern shore was continued during the spring season. Thirty-five trips were made in all. A total of 10,366 crates (8,555 large and 1,811 small), with a weight of 1,464,350 pounds were carried, as compared with thirty-six trips carrying a total of 11,690 crates (8,723 large and 2,967 small) with a weight of 1,605,150 pounds in 1933.

The following table will show the summary of shipments by ports as compared with 1933:—

	Crates collected	
	1934	1933
St. Peters.....	1,276	357
Petit de Grat.....	537	4,689
Arichat.....	3,728	731
Queensport.....	97	70
Canso.....	1,614	1,847
Dover.....	624	705
Whitehead.....	650	913
Port Felix.....	996	1,292
Coddles Harbour.....	546	446
Drumhead.....	244	377
Fisherman's Harbour.....	54	263
	10,366	11,690

As before, the subsidized smacks regularly covered that section of the coast between St. Peters', Richmond county, and Port Bickerton, Guysboro county. However, when accommodation was available shipments from other sections of the coast of Cape Breton as well as from Antigonish county, which had been brought to West Arichat by private smack, were transported on the regular boats to Boston and Gloucester. It was also found necessary to continue the practice of making direct trips to both Boston and Gloucester; shipments were consigned to both ports.

The benefits of the lobster collection service to the lobster fishermen of eastern ports during the past five years have been beyond question, and while the shipment of lobsters by direct smack to American ports was first tried out in an experimental way, it has now proved to be the most satisfactory method of transportation, particularly from the districts which cannot be served by rail. The representative of the fishermen shippers in Boston reported favourably with regard to conditions of lobsters on arrival in 1934 and noted a general improvement over previous years. One interesting feature was that the most satisfactory returns were received by fishermen who shipped as a group to one consignee. This method of marketing was developed during the year and will no doubt be continued in the future in communities where the fishermen are properly organized.

## PROSECUTIONS

During the year there were 239 prosecutions—7 in District No. 1, 139 in District No. 2, and 101 in District No. 3. (See Appendix No. 11).

## CONFISCATIONS

During the year 243 confiscations were made—12 in District No. 1, 112 in District No. 2, and 119 in District No. 3 (See Appendix No. 11).

## DEPARTMENT OF FISHERIES

## NEW BRUNSWICK

During the year 1934 there were 135,830,400 pounds of fish taken by New Brunswick fishermen and they had a landed value of \$1,936,614. The 1933 figures were 129,301,000 pounds, \$1,593,746.

The marketed value of the catch in 1934 was \$3,700,684 as compared with \$3,003,528 for 1933.

The following table shows the chief commercial varieties taken in New Brunswick with their landed and marketed values, as compared with 1933:—

1934			
Total quantity of all fish landed, lbs.....		135,830,400	
Landed value.....	\$	1,936,614	
Marketed value.....	\$	3,700,684	

	Lbs.	Landed	Marketed
Sardines.....		\$	\$
Lobsters.....	41,458,200	291,358	1,087,674
Herring.....	6,507,300	587,658	858,499
Smelts.....	42,495,300	153,629	436,321
Cod.....	3,686,800	298,744	420,064
Salmon.....	12,951,400	136,119	222,728
Hake and cusk.....	1,922,100	213,820	287,135
Alewives.....	7,637,400	29,316	61,070
Shad.....	4,800,300	17,816	52,239
Clams and quahaugs.....	1,174,300	39,042	52,063
Oysters.....	3,725,600	18,626	50,638
Scallops (shelled)..... gals.	1,654,600	34,143	44,870
	16,718	30,669	31,253

1933			
Total quantity of all fish landed, lbs.....		129,301,000	
Landed value.....	\$	1,593,746	
Marketed value.....	\$	3,003,528	

	Lbs.	Landed	Marketed
Sardines.....	26,022,400	113,228	622,531
Lobsters.....	7,494,000	514,579	830,363
Herring.....	48,371,200	153,885	390,088
Smelts.....	5,244,400	246,961	315,485
Cod.....	13,905,300	139,378	209,997
Salmon.....	2,261,300	223,786	287,333
Hake and Cusk.....	8,061,800	21,729	57,042
Alewives.....	4,879,400	16,197	54,893
Shad.....	754,700	25,709	29,152
Clams and Quahaugs.....	2,948,600	14,298	37,622
Oysters.....	20,032,400	36,485	46,906
Scallops (shelled)..... gals.	23,964	41,145	41,145

Only three of the chief varieties, sardines, shad, clams and quahaugs show increased catches, but many of them show increases in landed value.

The decline in the lobster catch is due to a reduced catch in the "late fishing" district south of Chockpish river, Kent county, which has been subjected to very intensive fishing during the past few years. The catch in the spring area shows a slight increase. On the Bay of Fundy coast the catch also increased as a result of a reduction in the minimum size limit and a more abundant supply of lobsters.

A decline is shown in the catch of herring but the marketed value shows a fair increase. The smelt fishery, which is chiefly confined to the east coast of the province, shows a heavy decrease in catch, but returns to the fishermen increased over \$50,000. The quality of smelts was above the average, a good proportion grading out as No. 1's and Extras. Salmon landings in the southern part of the province increased over 100,000 pounds. On the northeast coast, however, there was a drop of over 500,000 pounds which was mainly due to a

decrease in the Miramichi salmon drift-net fishery. Hake and cusk catch shows a decrease of over 420,000 pounds but landed and marketed values show fair increases. Owing to market conditions, a considerable decrease is shown in the catch of alewives in the southern part of the province, but on the north-east coast there was an increase of over 500,000 pounds and a much greater quantity could have been taken had market prospects been favourable. A large increase is shown in the catch, landed and marketed values of shad as well as in the landings of clams and quahaugs. There was a considerable falling off in the scallop catch.

*Inland District.*—The catch for the year in the inland district was 724,900 pounds with a marketed value of \$51,648, as compared with 541,300 pounds and a marketed value of \$37,956 in 1933—an increase of 183,600 pounds in catch and of \$13,692 in the marketed value. The chief commercial varieties taken in this district are alewives, bass, salmon and shad, and all show increases, with the exception of the salmon.

#### SPORT FISHING

In the Bay of Fundy district of New Brunswick some fair catches of trout were made in Canoose stream, Clarence stream, Didgeguash lake and lake Utopia. In the other lakes and streams fishing was poor.

The run of salmon in the Didgeguash river was much less than during the previous year.

In Wheaton lake fair catches of small black bass were made, but the larger fish appeared to be very scarce.

On the east coast angling conditions, generally, were not as good as in 1933. owing to water conditions. On the Restigouche river and its tributaries 3,508 salmon and 461 grilse were taken.

Trout fishing, which takes place in practically all the tributaries of the main rivers, was much the same as in 1933.

Stocking of streams with trout fry has been systematically carried out during the few years and good results are expected from this activity within a few years.

In the inland district water conditions throughout the season were favourable for angling and increased catches were made, both of salmon and trout. Sport fishermen landed 48,200 pounds of salmon, as compared with 42,300 in 1933, and 29,600 pounds of trout, as compared with 27,800 pounds.

During the spawning season conditions were favourable and it was reported that a very large run of Atlantic salmon ascended all streams for spawning, a larger run in fact than has been noted for some years past.

#### PATROL BOAT SERVICE

In the Bay of Fundy section the usual patrol boat service was carried on during the year. The *Gannet Rock* was engaged, especially in lobster protection, in Grand Manan waters, and frequently rendered assistance in transporting sick and injured residents to the mainland. The *Phalarope* performed the usual patrol services in all other parts of the district until June 5th, when no longer fit for such work, was taken to St. John and turned over to the Marine Department to be sold. The *Thresher* was transferred from Halifax to this district at that time and Captain Mitchell and crew of the *Phalarope* were placed in her. This boat has been performing the patrol duties since then. Largely owing to the activities of these patrol boats, illegal lobster fishing has been pretty well eliminated. Two small boats, the *Mildred C.* and *Ethel M.* were also employed. The former operated at Mace Bay and the latter from Grand Manan. Both performed valuable service in connection with the enforcement of the lobster regulations.



In the eastern section, as in previous years, five chartered boats were arranged for, but two of them were used elsewhere in the division for part of the summer, while two boats from outside the district, the *Venning* and *Arras*, were used to assist in the salmon and lobster protection. The efficiency of the patrol service is attested by the fact that during one of the most difficult years, from a protective standpoint, illegal fishing was kept within normal limits. The work of the patrol boat *Venning* on the Miramichi salmon drift-line was most effective and satisfaction was expressed by interested parties.

## PROSECUTIONS

There were 148 prosecutions for violation of the fishery regulations—15 in District No. 1, 113 in District No. 2, and 19 in District No. 3 (See Appendix No. 11.)

## CONFISCATIONS

During the year 400 confiscations were made—44 in District No. 1, 290 in District No. 2, and 66 in District No. 3. (See Appendix No. 11.)

## PRINCE EDWARD ISLAND

The year's total catch of all fish landed in Prince Edward Island for the year was 23,326,200 pounds. Its landed value was \$695,024 and the marketed value \$1,083,090. In 1933 the totals were 22,347,300 pounds, a landed value of \$518,857 and a marketed value of \$842,037.

The following table shows the chief commercial varieties taken by the commercial fishermen of the province, with their landed and marketed values, as compared with 1933:

1934

Total quantity of all fish landed, lbs.....	23,326,200
Landed value.....\$	695,024
Marketed value.....\$	1,083,090

	Lbs.	Landed	Marketed
		\$	\$
Lobsters.....	7,658,200	536,012	795,553
Cod.....	4,642,300	38,024	83,606
Oysters.....	2,032,000	36,852	60,061
Smelts.....	823,800	31,659	41,190
Herring.....	4,852,500	24,855	51,802
Mackerel.....	896,300	13,931	19,590
Hake and Cusk.....	1,544,800	6,704	17,869
Clams and Quahaugs.....	516,200	2,552	6,967

1933

Total quantity of all fish landed, lbs.....	22,347,300
Landed value.....\$	518,857
Marketed value.....\$	842,037

	Lbs.	Landed	Marketed
Lobsters.....	9,154,700	396,248	591,801
Cod.....	3,642,900	27,879	65,021
Oysters.....	1,328,600	21,582	37,431
Smelts.....	920,800	29,136	46,040
Herring.....	5,061,000	26,383	63,852
Mackerel.....	925,500	8,870	21,472
Hake and cusk.....	864,600	3,772	8,092
Clams and quahaugs.....	244,000	1,116	2,079

It will be noted that the figures in the table show substantial increases in the case of cod, oysters, hake and cusk, clams and quahaugs, in 1934 a heavy decline in the lobster catch but gains in lobster values, and slight decreases in smelt, herring and mackerel returns.

## SPORT FISHING

In Queens county fishing for pond and brook trout was good during the first part of the season, but sea trout, especially during the month of August, were scarce. In Wisner's pond, trout appeared to be in good condition during the entire summer, and a large number were taken during the season.

In Kings county trout were plentiful in practically all ponds and streams, and fishing good throughout the season. Special mention may be made of Murray river where a large quantity of trout is taken each year.

In East Prince county trout fishing was good in the early part of the season.

## FISHERIES PATROL SERVICE

In addition to the two government-owned craft, F. D. B. 1 and F.D.B. 2, six boats were employed in patrol service—two in West Prince, two in East Prince, three in Queens and one in Kings. Assistance was rendered by four boats from outside districts during the fall lobster season. Considerable fishing gear was seized, consisting of rope, traps, boats, anchors, as well as a quantity of lobsters.

## PROSECUTIONS AND CONFISCATIONS

There were fifty prosecutions during the year and ninety-four confiscations. (See Appendix No. 11.)

## MAGDALEN ISLANDS

During the year a catch of 25,305,900 pounds with a landed value of \$353,874 and a marketed value of \$518,539 was taken in the Magdalen Islands, as compared with a catch of 23,890,400 pounds, landed value of \$246,302 and marketed value of \$342,091 in 1933.

All of the eight fisheries returned increased marketed value and all save the mackerel fishery showed an increase in catch and landed value.

The following table shows the varieties taken with their landed and marketed values:

1934

Total quantity of all fish landed, lbs.....	25,305,900
Landed value.....	\$ 353,874
Marketed value.....	\$ 518,539

	Lbs.	Landed	Marketed
		\$	\$
Lobsters.....	3,034,300	220,760	287,648
Cod.....	8,183,600	81,906	118,098
Mackerel.....	2,778,000	19,477	50,543
Herring.....	10,714,400	21,428	45,881
Smelts.....	94,600	5,172	6,622
Clams.....	415,000	2,075	2,075
Halibut.....	20,000	1,000	1,400
Haddock.....	66,000	660	880

1933

Total quantity of all fish landed, lbs.....	23,890,400
Landed value.....	\$ 246,302
Marketed value.....	\$ 342,091

	Lbs.	Landed	Marketed
		\$	\$
Lobsters.....	2,677,600	135,895	175,545
Cod.....	8,103,500	64,725	82,977
Mackerel.....	3,526,000	20,588	44,268
Herring.....	9,067,900	18,136	31,943
Smelts.....	88,700	4,035	4,435
Clams.....	402,000	2,010	2,010
Halibut.....	7,200	338	338
Haddock.....	7,500	75	75

Codfish were fairly plentiful throughout the season and marketing conditions more satisfactory than they were in the previous year. There was an increase in the herring catch of about three-quarters of a million pounds. The mackerel catch also increased and the price of salt mackerel greatly improved during the season, but there was a fairly heavy decrease in the catch. The most satisfactory feature of the season's operations was the rise in the catch of lobsters. The catch increase was about half a million pounds with the gain in marketed value over \$112,000.

## THE DIVISION GENERALLY

### ILLEGAL FISHING

Every effort was made to concentrate patrol forces in the areas where illegal fishing conditions were most difficult to control and it was found necessary to use additional patrol boats in certain parts of the Gulf area to suppress illegal lobster fishing and packing. Lack of employment in general induced many who would not otherwise do so to attempt illegal lobster fishing and packing in an organized way, and most determined efforts were made to evade the regulations. It is gratifying to be able to report, however, that notwithstanding these conditions the situation was kept well in hand by the energetic and tireless work of the inspectors and their assistants and the patrol boats. Most effective results followed the combined use of land and water forces and flying patrols. The Royal Canadian Mounted Police rendered valuable assistance and co-operated with the department's officers in every feasible way where desired. Low water conditions facilitated poaching of salmon and trout and enhanced prices of canned lobster encouraged illegal packing but the record of seizures, confiscations and prosecutions for the year clearly indicates that the regulations were strictly enforced. The Miramichi area, where illegal salmon fishing was prevalent a few years ago, was particularly satisfactory in this respect and the growing co-operation there between the various commercial and sporting interests and the protective forces is most encouraging.

### LOBSTER PACK AND INSPECTION OF LOBSTER CANNERIES DURING 1934

During the lobster fishing season of 1934, licences to can lobsters were issued to 297 canneries within the Maritime Provinces and the Magdalen Islands. Of this number, 293 canneries actually went into operation, as against 289 canneries operated during the season 1933.

Provincial distribution of canneries in operation was as follows:—

Nova Scotia.....	87 in 1934, 88 in 1933
New Brunswick.....	96 " 99 "
Prince Edward Island.....	94 " 91 "
Magdalen Islands.....	16 " 11 "

During the year 114,694 cases of lobsters were packed, as compared with 120,771 cases put up during 1933 and 164,981 cases in 1932. The decrease in pack was thus 6,077 cases, as compared with the 1933 total and 50,287 cases as compared with the 1932 output.

In Nova Scotia there was a pack of 50,565 cases, as against 50,729 cases in 1933 and 74,000 cases in 1932. In other words, there was a decrease of 164 cases, comparing 1934 with 1933, and a decrease of 23,435 cases, when comparing 1934 with 1932. This latter decrease is explained in part by the fact that during 1932 there were 6,007 cases put up in western Nova Scotia where there is now no packing.

New Brunswick's pack for 1934 was 23,816 cases, compared with 26,417 cases in 1933 and 35,490 cases during 1932, a decrease of 2,601 cases as between 1934 and 1933 and of 11,674 cases, when 1934 and 1932 are compared.



Prince Edward Island packed 30,215 cases during the year, 32,895 cases in 1933 and 44,490 cases in 1932. This discloses a decrease of 2,680 cases when 1934 is compared with 1933 and a decrease of 14,275 cases as between the years 1934 and 1932.

Canners in the Magdalen Islands put up 10,096 cases in 1934, 10,730 cases in 1933 and 10,941 cases in 1932, or 634 cases less in 1934 than in 1933 and 845 cases less in 1934 than in 1932.

The major part of the total decrease of 6,077 cases in 1934 was accounted for by a drop in output during the fall season in the Strait area. The decrease in pack in that region amounted to 5,356 cases, 8,214 cases being packed during 1934 as against 13,570 cases during 1933. The pack in this district during 1932 was 18,183 cases.

Figures for the fall season show: Nova Scotia, 581 cases in 1934, 983 cases in 1933 and 1,296 cases in 1932; New Brunswick, 6,698 cases packed in 1934, 10,901 cases during 1933 and 14,268 cases during 1932; Prince Edward Island, 935 cases in 1934, 1,686 cases during 1933 and 2,619 cases during 1932.

In the course of the year 1,834 inspections of canneries were carried out by 34 inspecting officers, an average of 6.3 inspections per cannery during the year. Inspectors were instructed to give particular attention to the matter of "underweights" and cannery inspection reports indicate that forty-four cases of "underweights" found throughout the division were dealt with. Final tests called for the marking of the affected pack "Underweight" in nineteen instances. The portion of the pack thus affected and marked "Underweight" was:—

70½ cases.....	12 oz.
125½ ".....	6 "
22 ".....	3 "

By provinces these underweight packs were as follows:—

Nova Scotia.....	60 cases.....	12 oz.
	94½ ".....	6 "
	12 ".....	3 "
Prince Edward Island and Magdalen Islands.....	10½ cases.....	12 oz.
	30½ ".....	6 "
	10 ".....	3 "

During the year canneries were graded in accordance with the provisions of the Meat and Canned Foods Act and the summary given below shows comparison between the years 1932, 1933 and 1934:—

	1932	1933	1934
Number of canneries in operation.....	311	289	293
Construction and equipment:			
Average score:	75.6	81.1	82.8
Per cent scoring under 60.....	14.8	0.3	0.0
"      "      60-74.....	29.5	32.9	26.6
"      "      75-100.....	55.7	66.8	73.4
Operation and sanitation:			
Average score:	85.4	89.9	89.2
Per cent scoring under 75.....	11.2	2.1	0.0
"      "      75-84.....	88.8	18.7	21.5
"      "      85-100.....		79.2	78.5

#### NUMBER OF CANNERIES SCORING LESS THAN SUCCEEDING YEAR'S MINIMUM MARKS

	1932	1933	1934
In construction and equipment.....	46	26	78
In operation and sanitation.....	35	26	63

## DEPARTMENT OF FISHERIES

## CANNERIES OPERATING WITHOUT RETORTS

	1927	1930-31	1932	1933	1934
Number.....	110	126	120	93	82
Percentage.....	54	42.8	38.6	32.2	28

INSPECTION OF PICKLED FISH CONTAINERS, FISH CURING ESTABLISHMENTS  
AND EDUCATIONAL WORK

The requirements of the Fish Inspection Act, which authorize the inspection of certain classes of salt and pickled fish, such as mackerel, herring and alewives, were effectively carried out by the qualified inspectors, grade 2, under the direction of Robert Gray, Supervisor of Pickled Fish for the division. This work also includes educational interviews with fishermen and packers, the inspection of fish curing premises and utensils, the inspection of empty pickled fish containers, as well as the inspection of oysters and hard cured smoked round herring.

The results of the past two years' work are as follows:—

	1934	1933
Educational visits.....	1,708	2,034
Inspection of fish premises.....	2,926	2,442
“ empty containers.....	63,655	72,111
“ salt alewives.....	6,950 bbls.	7,579 bbls.
“ pickled herring.....	18,928 “	19,512 “
“ salt mackerel.....	43,600 “	59,128 “
Inspection smoked herring.....	238,681-18 lb. boxes	217,739-18 lb. boxes
Inspection of oysters.....	6,153 bbls.	9,665 bbls.
	1,436 boxes	1,460 boxes

The compulsory inspection of the classes of fish coming under the Fish Inspection Act became effective in 1932 and the regulations under the act were amended during 1934 to provide for the grading of mackerel and smoked herring, in accordance with the requirements of the trade. The inspecting officers are required to take a qualifying course at the Fisheries Experimental Station, Halifax, N.S., before they undertake inspection work, and since these arrangements have been effective, there has been definite improvement in the inspection service.

## MARKETING CONDITIONS

Compared with the last few years marketing conditions were much more favourable during 1934. In some of the chief export fishery products the demand was more in keeping with the supply, resulting in more satisfactory prices to the exporter and the producer. There was an improvement in the dried fish business and fishermen were able to dispose of their stocks at prices that gave them a small profit over the cost of production. Particularly bright features were the steady improvement in the demand for salt mackerel at prices more than double those offered in the previous year, the keen demand for canned lobster, and the successful marketing of a large sardine and smoked herring pack. Trade restrictions and financial difficulties in some of the dried fish markets were causing concern at the close of the year but, all in all, it can be said that the whole marketing situation in 1934 was much brighter than it has been for several years.

## FRENCH QUOTA FOR CANNED LOBSTERS

The quota for canned lobsters authorized by the French-Canadian trade agreement on May 12, 1933, was continued during 1934 and certificates of origin covering all shipments entering France under the preferred tariff were issued from the headquarters office of the division, with apparent satisfaction to the exporters. Under the quota, 3,000 metric quintals, or about 9,000 cases of lobsters, were permitted to enter France under the preferred tariff. Full advantage was taken of this preference in shipments going forward during the year.

## LOSS OF GEAR

Severe losses in gear were suffered by fishermen during the year, the most serious being damage to sardine herring weirs in the Bay of Fundy district of New Brunswick, estimated at \$66,000 and losses in smelt gear on the east coast of New Brunswick, estimated at \$55,000. There was the usual loss of lobster traps, the heaviest losses being in southwestern Nova Scotia, where they were estimated at \$25,000. The total losses in gear recorded in the division during the year is approximately \$200,000.

## LOSS OF LIFE

It is with great regret that the death of thirty-one fishermen in following their hazardous occupation during the year is reported. Twenty-seven were lost in Nova Scotia, two in New Brunswick and two in Prince Edward Island.

## REDUCTION OF FISH WASTE AND COARSE FISH

During the year eighteen reduction plants were operated in the division. Of these fifteen were located in Nova Scotia and the remaining three on the Bay of Fundy section of New Brunswick. The total production was much more than in the previous year and included the following products:—

5,161 tons fish meal valued at.....	\$ 232,394
25,369 gals. fish oil, crude, valued at.....	9,300
38,212 gals. cod oil, valued at.....	18,040
68,980 gals. herring oil, valued at.....	10,928

## FISHERMEN'S ORGANIZATIONS

The United Maritime Fishermen completed its fifth year of organized activity, making steady progress, notwithstanding the unfavourable economic conditions that have prevailed since the organization was formed. The annual convention was held at Charlottetown during October and the report of the secretary of the central office of the association indicated that satisfactory marketing contacts had been made, both in the selling of the production of co-operative plants and in the purchase of fishing supplies.

During the year twenty-two co-operative lobster canneries were in operation and their total production was approximately 12,000 cases. Several new co-operative canneries were in operation in the eastern Nova Scotia district. The co-operatives also entered the pickle-cured codfish field in quite a substantial way and produced a cure of splendid quality which was marketed to advantage.

Various groups of lobster fishermen also marketed live lobsters co-operatively with the result that much more satisfactory returns were obtained than were formerly received for individual shipments. The lobster were shipped to the United States market by dry smacks.

Plans were formulated during the latter part of the year for more intensive organization work by the United Maritime Fishermen in different places, particularly on the east coast of New Brunswick, where there appears to be a splendid opportunity for organized activity by the fishermen. The central office of the organization, which is located at Halifax, rendered most valuable



service to the local stations of the association in making market contacts, both for buying and selling, and in a good many instances in negotiating direct purchases and sales. These services included the marketing of canned lobsters and salt mackerel, as well as the purchase of rope, twine, lines and other fishing supplies.

#### STAFF

There were several changes in the staff of inspectors in the division during the year. Inspector A. C. McNally, of the York-Sunbury district, New Brunswick, retired on December 6th, and was replaced by E. G. Hunter.

J. A. Jardine was appointed for Restigouche county, replacing Inspector Fournier who retired during December, 1933, and J. J. Lozier was appointed inspector in the vacant district of Gloucester county.

On Prince Edward Island, Neil MacLeod was appointed inspector in the vacant district of Prince county East, and in Pictou county West, Nova Scotia, George M. Adamson was appointed to fill the vacancy existing. There was also a vacancy in Annapolis county, Nova Scotia, caused by the death of Inspector Elmer Morgan in August, 1933; this was filled by the appointment of Bruce Hunter on May 16, 1934.

The organization throughout the division has been well maintained and the various services co-ordinated with most effective results. Where found necessary, inspectors have been moved temporarily from one district to another to assist in suppressing illegal fishing or to take over fish inspection duties when the local officer was unable to take care of the work at hand. Co-operation with the provincial game wardens in New Brunswick and with the Royal Canadian Mounted Police in all parts of the division is producing most satisfactory results, as evidenced by the distinct improvement in the situation as regards illegal fishing.

During the year conferences attended by the hatchery superintendents and the inspectors and supervisors were held in each district for the purpose of exchanging information and discussing arrangements for the distribution of hatchery fish, etc. Both sets of officers have greatly benefited by these meetings and the arrangements so made have facilitated the distribution from the hatcheries.

A conference of supervisors was held at Halifax during January for the purpose of considering suggested changes in the fishery regulations for the three provinces and outlining the work generally for the year. Revised regulations became effective later in the year.

#### ANNUAL REPORT OF CHIEF SUPERVISOR OF FISHERIES, MAJOR J. A. MOTHERWELL, WESTERN DIVISION (BRITISH COLUMBIA), FOR 1934.

The prices paid by the manufacturing branch of the salmon industry were so attractive during 1934 that fishing intensity was considerably increased, particularly in the sockeye fishery. The stocks of canned salmon at the first of the year were fairly well cleared up and there seemed to be reason to expect that the market conditions would show improvement. Unfortunately the markets were not able to absorb as large a percentage of the British Columbia pack as was anticipated and at the end of the year considerable stocks were yet to be found in the hands of the canners, with prospects for disposal at a profit not encouraging.

A very satisfactory total of 1,582,926 cases of all varieties of salmon was packed during the year, which is the largest since the year 1930 and compares very favourably with the average for the past five years, or 1,367,183 cases,

as shown by the following statement covering averages in five-year periods for the past fifteen seasons:—

1920-1924.....	1,234,134 cases
1925-1929.....	1,716,531 “
1930-1934.....	1,367,183 “

#### SOCKEYE

The sockeye total of 377,882 cases for the year 1934 exceeds that of any year since 1925, with the exception of 1930, when the pack of this variety amounted to 477,678 cases.

The average for the past five years was 337,897 cases, as shown below:—

1920-1924.....	303,836 cases
1925-1929.....	304,503 “
1930-1934.....	337,897 “

*Naas River Area.*—The catch of 36,242 cases in the Naas River area was surprisingly good and had not been equalled since the year 1915. This total may be compared with 16,347 cases in 1929 and 26,500 cases in 1930, the packs of these years being cited in view of the fact that the Naas River run is composed of four and five-year fish.

*Skeena River Area.*—The catch in this area was disappointing, only 54,558 cases, compared with a total in 1929 of 77,714 cases and in 1930 of 130,952. The Skeena River run of sockeye is also composed of four and five-year fish.

There appeared to be every reason to expect that the pack would have been in the vicinity of 90,000 cases, in view of the totals in the brood years noted above and the conditions found on the spawning grounds. However, whilst the pack in 1934 has been disappointing, the conditions on the spawning grounds were found to be reasonably satisfactory, so that it is evident that the conservation measures were sufficient to allow for a reasonable escapement.

*Rivers and Smiths Inlets.*—In these areas the catch was not up to expectations. The total pack was 89,575 cases, compared with 79,548 cases in 1929 and 150,398 cases in 1930. As in the Naas and Skeena, the runs here are composed of four- and five-year fish. In these areas, also, the escapement was found to be good, particularly in Smiths Inlet, and there is no doubt that the regulatory measures taken provided for an adequate escapement to the spawning grounds.

In these areas gill-net fishing is considerably less difficult, from an operating standpoint, than in the areas farther north and this fact, together with the expected good run and the unusually satisfactory price being paid for sockeye, resulted in a large increase in the number of boats being operated. The catch, therefore, instead of being divided amongst a reasonable number of fishermen, was spread over perhaps 100 per cent more fishermen than could profitably operate in the area. Instead of returning home at the end of the season with comfortable profits, practically all the gill-netters lost money on the season's operations. It would appear that the industry has it in its power to regulate this matter to a very large extent but so far the different groups appear to have been unable to work sufficiently close together in this regard.

*Fraser River Area.*—The sockeye total of 145,579 cases for this area is an unusually large one and is largely accounted for by what in recent years has become known as the “late Fraser river sockeye run,” which has appeared after approximately August 25th in the cycles of 1926, 1927, 1930, 1931 and 1934.

The total shown for 1934 included 14,491 cases imported from Puget sound waters and 18,063 cases obtained from Districts Nos. 2 and 3, but is exclusive of 5,643 cases of Fraser river sockeye packed in Districts Nos. 2 and 3.



A comparison of the toll taken from the run proceeding to the Fraser river by gear on both sides of the international boundary shows a total pack for 1934 of 491,855 cases, which compares with 450,944 cases in the brood year of 1930. Out of this total 352,579 cases were caught and packed in Puget sound water although the salmon were proceeding to the spawning grounds of the Fraser river on the Canadian side.

#### SPRINGS, BLUEBACKS AND STEELHEADS

The packs of springs, bluebacks and steelheads remain small comparatively as a result of the demand being greater for these fish in the frozen or fresh condition, rather than canned.

#### COHOES

It will be observed that the coho pack of 195,874 cases for 1934 is the largest on record. It is a fact, of course, that the demand for cohoes fluctuates from year to year, but the prospects for the marketing of the 1934 pack appeared to be sufficiently good to justify the larger output. The run was unusually good throughout practically the whole province and it is felt that with consistently good marketing conditions the quantities canned each season should remain high.

The comparison, in five-year periods, covering canned coho production the past fifteen seasons is as follows:—

1920-1924.....	110,018 cases
1925-1929.....	167,397 "
1930-1934.....	143,813 "

#### PINKS

The statement following, showing the pink salmon pack in two-year groups covering the past fourteen seasons, gives an average for the last two years of 483,961 cases, compared with a pack during 1934 of 435,364 cases.

1921-1922.....	387,442 cases
1923-1924.....	549,246 "
1925-1926.....	609,196 "
1927-1928.....	519,989 "
1929-1930.....	794,953 "
1931-1932.....	215,355 "
1933-1934.....	463,961 "

The normally large pink run to the Massett Inlet area of the Queen Charlotte islands, which was a failure in the brood year of 1932, returned in apparently normal abundance in the season under review. A larger pack could probably have been permitted with safety but it was considered desirable to be on the safe side and make sure of a good escapement to the spawning grounds.

This was an "off" year for pinks in the Fraser river district.

#### CHUMS

A total of 513,184 cases of chums packed in 1934 compared very favourably with recent catches of this variety of salmon and particularly well with the last five-year average of 314,137 cases, as shown by the statement following:

1920-1924.....	280,558 cases
1925-1929.....	632,042 "
1930-1934.....	314,137 "

#### SALMON—QUALITY

As in the case of the large pink salmon run to the Fraser river, the sockeye runs pass through Puget Sound waters on their way to the spawning grounds of the Fraser river on the Canadian side.



The late runs of sockeye which occurred in the years 1930, 1931 and 1934 were fished intensively by the operators to the south of the international boundary and approximately 75 per cent of the runs to the Fraser river were taken by the fishermen in Puget sound. The quality of the fish in these late runs is first class in the salt water of Puget sound, as in the case of the pink salmon, but when the sockeye have passed from United States waters to those on the Canadian side they play about for several weeks between the mouth of the Fraser river and the international boundary and while remaining in this area they rapidly deteriorate in quality, owing to the influence of the fresh water of the Fraser.

District No. 1, which is the Fraser river area, is primarily a gill-net district but it was found that by means of gill-netting a reasonable proportion of the sockeye run in good condition could not be taken owing to the clear water conditions in the gulf of Georgia. This being so, and in order that the Canadian industry might obtain a fair share of Canadian fish in good quality, purse seining was allowed in 1934 for the first time for the sockeye run to the Fraser. Such operations, however, were not permitted until September 1st in order to confine them to the late run. The earlier sockeye do not delay in their progress towards the spawning grounds but continue up the river and are taken in good condition by the gill-netters.

The result of this year's seining was a larger percentage than usual of good quality sockeye.

Under contract, the gill-net fishermen received a good price for their sockeye up to September 15th, although many caught following September 1st were in poor condition. Immediately after the 15th, however, the prices dropped very rapidly, owing to the inferior quality and the fact that most canners in the district refused to take the sockeye at any price. As a result, 224,295 sockeye were exported to canneries on Puget sound, the price paid to the fishermen on the Canadian side being ten cents per fish, compared with sixty cents paid by the Canadian canner for gill-net fish of good quality caught prior to September 15th.

With regard to quality generally, the following extract from a communication from the Canned Salmon Inspection Board will be found of interest:

"The Board of Inspection for British Columbia salmon considers that it should at this time draw your attention to the large number of parcels now coming up for examination which cannot be approved for the Government certificate. Last season these were few in number and it was felt that the industry was to be congratulated on the widespread improvement in packing over the output of the previous and earlier years. It is to be regretted that it is so manifest this improvement has not been fully maintained. Large blocks of Fraser sockeyes packed subsequent to the first few days of September have to be classed as second quality on account of softness. The condition of this sockeye appears to be characteristic of the salmon itself owing to lateness and not due to careless handling."

The board's remarks applied to fish caught by gill-nets from the late run, as practically all Fraser sockeye refused certificate by the Inspection Board were gill-net caught.

#### INSPECTION OF CANNED SALMON

The operations of the Canned Salmon Inspection Board continue to show the necessity for some such control of the packing operations. Notwithstanding the experience of recent seasons, there were still found some operators who did not take sufficient care and who suffered very considerably through the board's refusal of certificates to considerable parcels of the pack, particularly parcels from the late run of sockeye to the Fraser river packed after September 1st.

Below will be found particulars of canned salmon inspections during 1934.

Number of inspections made.....	3,123
Total number cases inspected.....	1,550,700
Total number cases rejected.....	28,949
Total number cases available for certificate.....	1,521,751
Total amount of fees paid.....	\$ 15,208 24

## DETAILS OF CANNED SALMON INSPECTIONS, ACCORDING TO SPECIES

Species	Number of cases inspected	Number of cases rejected	Number of cases available for certificates
Sockeye.....	270,511	21,091	349,420
Springs.....	28,908	125	28,783
Steelheads.....	921	.....	921
Bluebacks.....	28,102	110	27,992
Cohoe.....	197,905	500	197,405
Pinks.....	433,621	5,063	448,558
Chums.....	470,732	2,060	468,672
Totals.....	1,550,700	28,949	1,521,751

## PARTICULARS OF NON-CERTIFIED CANNED SALMON REJECTED, ACCORDING TO SPECIES

Species	Below Second Quality	Second Quality	Tips and Tails	Totals
Sockeye.....	75	19,346	1,670	21,091
Springs.....	.....	125	.....	125
Bluebacks.....	.....	.....	110	110
Cohoe.....	.....	500	.....	500
Pinks.....	144	4,919	.....	5,063
Chums.....	933	1,127	.....	2,060
Totals.....	1,152	26,017	1,780	28,949

## CANNED SALMON—EXPORTS

The following statement shows the exports of canned salmon from the port of Vancouver during the year:—

Australia.....	260,126 cases
Africa—South.....	58,912 “
“ North.....	100 “
“ East.....	1,743 “
“ West.....	1,154 “
Belgium.....	22,484 “
Bolivia.....	295 “
Canary Islands.....	50 “
Central America.....	10 “
Chile.....	275 “
China.....	1,081 “
Colombia.....	25 “
Denmark.....	291 “
East Indies.....	1,537 “
Eastern Canada.....	176,486 “
Egypt.....	280 “
Fiji Islands.....	4,389 “
France.....	119,990 “
Germany.....	2,936 “
Gibraltar.....	100 “
Irish Free State.....	50 “
Italy.....	106 “
India.....	7,671 “
Japan.....	49 “
Mauritius.....	1,055 “
Norway.....	50 “
New Zealand.....	45,082 “
Panama.....	865 “
Palestine.....	30 “
Peru.....	230 “
Philippines.....	3,550 “
South America, n.e.s.....	2,132 “
Straits Settlements.....	578 “
South Sea Islands.....	3,073 “
Switzerland.....	400 “
Sweden.....	50 “
United Kingdom.....	291,405 “
U.S.A., Pacific.....	2,063 “
West Indies.....	12,790 “
Total.....	1,023,493 cases

## SALMON—EXPORTS AND IMPORTS (RAW—FOR CANNING)

The following statement shows, in cases, particulars of sockeye salmon exported to and imported from United States waters during the season 1934 for the purpose of canning:—

	Imports	Exports
Alaska.....	2,028	
Puget Sound waters.....	14,496	20,390
Swiftsure Bank.....	4,811	

## SALMON—CONSERVATION

As an instance of the excellent results obtained in the way of restoration of valuable salmon runs, reference is made to the sockeye fishery in the Barclay Sound area. Due to the planting of sockeye eggs in the spawning streams of the Sproat and Great Central Lake areas, coupled with restrictions on fishing operations over a period of years, the runs of sockeye have been restored to their original size, at least. During the season 1934 the catch, in round figures, amounted to 75,000 fish, compared with 60,000 in the preceding year and 47,860 in the brood year of 1930. Notwithstanding this good catch the escapement of adult fish to the spawning grounds has been very good.

## SALMON—DRYSALTED

Following is a statement showing the packs of drysalt salmon in British Columbia since the year 1925:—

	Sockeye	White Springs	Cohoos	Pinks	Chums	Totals
1925.....		4,580		2,137	131,737	136,217
1926.....					139,858	139,858
1927.....					81,870	81,870
1928.....			48		170,205	170,253
1929.....					77,362	77,362
1930.....				1,291	114,932	116,223
1931.....	520	9,743	4	40,371	336,055	386,693
1932.....		8,142			119,147	127,289
1933.....		89		7,469	75,317	82,875
1934.....			2		94,357	94,359

The variation in the drysalted total from year to year is, of course, due practically altogether to the market conditions. This product is all shipped to the Orient but during recent seasons the market conditions have become more difficult, owing to the exchange situation. The smaller totals, during the last two years particularly, are no indication of the supply of salmon as it will be noticed that the principal variety used is the chum, which has shown no signs of lessened abundance.

## FREEZING OF SALMON

Salmon freezing continues to increase in volume, particularly freezing of shipments for European markets. The principal points of shipment are Vancouver, Prince Rupert, Victoria and New Westminster, where large cold storage facilities are available.

## SALMON—CATCH BY FISHERMEN

An interesting statement is appended (Statement 18) showing the catches of the different varieties of salmon by the several methods of fishing in 1934.



The total catch by all means was 24,723,242 fish, compared with a total of 18,540,542 for the season 1933. The increase was mainly due to the larger catches of sockeye, springs, cohoes and chums.

#### POWER BOATS IN SALMON FISHING

The number of power boats used in the northern salmon gill-net areas has shown a steady increase from 85 in 1924 to 2,922 in 1934. See Statement 15.

#### SALMON FISHING—STRIKES

From a standpoint of labour trouble in the fishing industry, 1934 was a satisfactory year, the only difficulty of any moment being a strike among the sockeye gill-netters in the Nitinat area, covering a period of one week. The fishermen stated that the price paid them was not satisfactory but after a week's idleness an adjustment was reached and fishing operations continued until the end of the season.

#### FRENCH QUOTA FOR FROZEN SALMON

The year under review was the first in which the quota system has applied to frozen salmon shipments to France. The total allowed Canada for 1934 was a quota of 375 metric quintals or 82,500 pounds between October 1st and December 31st.

In view of the short notice that was given of the adoption of the quota the allotment was made to the several handlers on a pro rata basis according to the applications submitted.

The varieties of frozen salmon required by the French market are the coho, red spring and steelhead.

#### FRENCH QUOTA FOR CANNED SALMON

This was the second year in which shipments of Canadian canned salmon were made to France under the quota arrangements of the Trade Agreement of May 12th, 1933. Whilst the first quota, covering the period to September 25th, 1933, was for 25,000 metric quintals, a further quota was arranged covering the period October 1st, 1933, to November 30th, 1934, for 74,670 metric quintals or 16,427,400 pounds.

Under this second quota the shipments made in 1934 amounted to approximately 3,143,000 pounds, the remainder having been shipped in the last three months of 1933. In the month of December, 1934, shipments totalling 6,691,000 pounds were also made against a further quota arranged to cover the calendar year 1935.

#### HALIBUT

There was an increase of 12,230 hundredweights in the landings of halibut at British Columbia ports during the year. The total was 182,602 hundredweights, compared with 170,372 for the preceding year. Of this total 96,682 hundredweights were landed by Canadian boats, which numbered 115, as compared with 82,799 hundredweights by 83 boats in 1933, including all boats landing under five as well as those landing over five trips.

Fishing commenced on March 1st, 1934, instead of February 15th, as in the preceding year, and the quota for Area 2 was caught so early that the International Fisheries Commission closed this area to fishing at midnight of August 19th. The landings from Areas 3 and 4 necessitated the closure of these areas also at midnight on October 27th.

The halibut industry was found to be even more profitable than during the preceding year and the boats which during 1933 had operated for only a part of the year continued through the whole season of 1934.

A pleasing development in the halibut industry, as far as British Columbia is concerned, is the increased demand from England, France, Belgium and Holland. The fish are frozen in the cold storage plants on the British Columbia coast and then forwarded to destination. By the expansion of this demand a further satisfactory market is available for Canadian caught halibut.

Halibut livers were again a considerable factor in the profits and the quantity landed at British Columbia ports totalled 3,160 hundredweights, valued at \$69,148.

#### DRYSALT HERRING

For many years past drysalt herring has been packed on both the east and west coasts of Vancouver island for shipment to Oriental markets. The total annual pack has ranged from fifteen and twenty thousand to a maximum of sixty thousand tons, depending on the market demand and available supply of the raw product.

There was usually a profitable business available each year providing due consideration was given to orderly marketing but unfortunately this was just the one factor in the business which had been greatly lacking among the British Columbia operators.

The bulk of the drysalt herring has been shipped to Chinese markets, either directly or through Japanese middlemen, but instead of this business being a profitable one each year it was often just the reverse due, amongst other factors, to the lack of orderly marketing, certain differences local to the Orient, and the difficult exchange situation obtaining from time to time, particularly during the last few seasons.

For the purpose of rectifying the unsatisfactory situation, particularly as far as orderly marketing is concerned, the industry in the year under review took advantage of the federal Natural Products Marketing Act of 1934 and applied for a Local Board to cover the salt fish business. The result was the appointment by order-in-council of the British Columbia Salt Fish Board, which immediately took control of the drysalt herring business although, owing to the season being so far advanced, it was not possible to include drysalt salmon for 1934.

The Local Board, after surveying the situation from the standpoint of markets and producers, arranged a total production in British Columbia of 20,500 tons, divided among fifteen drysalt herring plants, eleven of which operated on the east coast of Vancouver Island and the remaining four on the west coast.

It is too early to determine exactly how far the board has been of assistance to the drysalt herring business of the province but there appears to be reason to believe that its appointment will go a long way towards turning what has been, in many seasons, a losing enterprise into one reasonably profitable.

The herring pack during the year 1934 amounted to 414,626 hundredweights, compared with 513,024 hundredweights in the preceding year. These figures, however, are no indication of the abundance, as the pack in the latter part of the year was restricted, under the board's control plans. As a matter of fact, the runs of herring to British Columbia waters during the year were very large and had conditions warranted further operations it would have been a simple matter to increase the catch very materially.

#### PILCHARDS

In 1933 the run of pilchards was practically a failure, so far as British Columbia waters were concerned. The fish were discovered, after considerable search, many miles to the south of Canadian waters but it was impracticable to carry them such a long distance for processing. In the 1934 season, however, the pilchards returned in their usual abundance and the result was a pack of



35,437 cases, compared to 2,946 the preceding year, and a corresponding increase in meal and oil from this particular variety of fish. See Statement 10 and Statement 11.

#### WHALING

The total catch of whales, 350, is an increase of 141 over that of the previous year. The catch of sperms showed an increase of 75 and that of the finback whale a decrease of 46. See Statement 12.

#### FISH MEAL AND OIL

The production of fish meal and oil shows a considerable expansion over that of the previous season. The greatest increase, of course, is in the case of the pilchard products. It will be remembered that the pilchard run of 1933 was practically a failure but the fish returned in normal quantities again in the season under review.

Whaling operations for the season also show considerable improvement over those of the previous year, and as a matter of fact the quantity of whale oil obtained has not been exceeded in the last fifteen years.

Meal and oil produced from other sources, including salmon and halibut offal, also provided larger totals.

#### OYSTERS

Due to the success in the introduction of imported oyster spat to British Columbia waters, there is being built up an increasing supply both for the fresh market and also for the purpose of canning. Cannery output resulted during the year in a pack of 860 cases and there appears to be every reason to expect that in view of the manner in which this product has been accepted in the market the quantities processed will increase materially.

#### FUR SEAL SKINS

The year under review produced the smallest take of fur seal skins since 1915. The year's catch reduction was undoubtedly the result of a drop in the price of seal skins in recent years, coupled with the profitable salmon trolling operations, to which latter fishing the attention of the Indians was largely confined.

The price average of \$2 per skin offered no encouragement to the hunters.

#### SCALLOPS—DRAGGING EXPERIMENT

The Canadian Halibut Vessel Owners' Association suggested that investigation should be carried out by the department to ascertain the possibility of developing a scallop fishery on the Pacific coast. Equipment commonly used in Atlantic Coast waters was forwarded to Prince Rupert by the department and tests were conducted about the Queen Charlotte islands, along the east side of Hecate straits, and at several points from Departure bay to Sidney on the east coast of Vancouver island. The results were not encouraging as it was found that although in most of the areas in which experiments were conducted a few samples of scallops were obtained, they did not appear to be present in sufficient quantities to justify commercial operations. It is proposed to make further tests next year.

#### DESTRUCTION OF SEA LIONS

The first landing of the sea lion expedition in 1934 was made on the Virgin rocks, where a considerable number of adult lions and pups were found. Here and at the Pearl rocks a total of 663 adults and 125 pups was destroyed. The weather conditions were very difficult, as is very often the case in that area,



and on only two days, June 9th and 13th, could landings on the hauling-out grounds safely be made. An attempt to place a party on the Scott islands was unsuccessful, owing to the weather.

The captain of the *Givenchy* observes that this year comparatively few pups were found, none at all being observed on the Pearl rocks.

#### PATROL SERVICE

A total of 114 boats were used in the patrol service, including 21 departmentally-owned, 82 chartered power boats, and 11 rented rowboats.

The two fisheries protection steamers, the *Malaspina* and *Givenchy* continued to give excellent service in their patrol of the three-mile limit, protection of Canadian waters from illegal use by foreign fishing boats, guarding the fur seals on their annual migration to the rookeries in the Pribilof islands, and in numerous other duties assigned from time to time.

The *Givenchy* was again utilized during a portion of the winter for life-saving duties at Bamfield on the west coast of Vancouver island.

The *Malaspina* during the year logged 26,962 miles and the *Givenchy* 15,240 miles.

A total of 262 hours 10 minutes flying time was utilized in aerial protection of the fisheries, as will be observed from the following statement:

Base	—	Hours	Minutes
<i>District No. 2—</i>			
Swanson Bay.....		143	55
<i>District No. 3—</i>			
Alert Bay.....	39 h. 00 m.		
Nootka.....	5 h. 10 m.		
Nanaimo.....	53 h. 30 m.		
Tofino.....	3 h. 25 m.		
Quathiaski.....	17 h. 10 m.	118	15
Total for Season.....		262	10

Aerial patrol still continues to give good service and, in fact, the efficiency is felt to be increasing, due to the improved type of flying boat now available. The cost of this service is now much less than in the years when flying was still in the experimental stage.

#### VIOLATIONS

Below will be found a statement showing the number of violations in each district during the year, together with the revenue received in fines and from sales of confiscated articles:

—	District No. 1	District No. 2	District No. 3	Totals
Violations.....	56	54	74	184
Fines.....	657 00	1,897 50	1,202 50	3,757 00
Sales.....	762 46	201 58	359 01	1,323 05
Totals.....	\$1,419 46	\$2,099 08	\$1,561 51	\$5,080 05

The number of violations shows an increase of 24 over the preceding year. A more detailed statement will be found in Appendix No. 11.

## SPORT FISHING

Numbers of visitors to British Columbia have commented on the excellent sport fishing obtained during 1934. Fly fishing for cohoes along the shores of the east coast of Vancouver island, as well as salmon trolling on a large portion of the coast, continues to increase in popularity and is the means of attracting each year many visitors to the province.

The work of the fish cultural branch of the department has been the means of providing excellent trout fishing in numerous lakes and streams within reasonable reach of those desiring to engage in this class of sport.

The fish and game associations of Vancouver island have recently formed a central body known as the Amalgamated Fish and Game Associations of Vancouver island. There is already a similar association on the mainland and it has been found much easier and more satisfactory in every way to deal with one association than numerous small bodies whose interests and requests are often very dissimilar.

During the year 265 plantings of sport fish eggs and fry were made by the department's officers—3,292,678 eggs and 3,337,221 fry as shown by the following statement:

Species	Number of Plantings	Number of	
		Eggs	Fry
Atlantic salmon.....	3		19,344
Kamloops trout.....	205	2,813,933	2,713,335
Cutthroat trout.....	18	110,000	246,141
Brown trout.....	4		16,360
Steelhead trout.....	6		182,783
Eastern brook trout.....	12	80,000	175,441
Rainbow trout.....	17	288,745	3,161
Totals.....	265	3,292,678	3,337,221

The Cranbrook, Kelowna, Vernon, Penticton and Revelstoke anglers have continued their own fish cultural operations with eggs or fry supplied by the department and have made considerable progress in the rearing and liberation of advanced fry and fingerlings.

Numerous associations continued to express their appreciation of the assistance rendered the anglers by the department through allotments of eggs and fry, the assistance of the engineering staff, the fish cultural officers, and the inspectors.

## ENFORCEMENT OF REGULATIONS

Notwithstanding the intensive fishing throughout the year, particularly for salmon, the observance of the regulations by those engaged in the industry has been reasonably good. The fishermen appear to be becoming more alive each year to the fact that it is in their own interest to observe the regulations and so protect the natural resource which should provide a living for a great many individuals indefinitely.

## LICENCES

The number of salmon purse-seines operating was 296, compared with 238 in the previous year; and 6,113 salmon gill-nets, compared with 5,438 in 1933. Salmon trollers numbered 3,045, compared with 2,815 in the preceding year. The total of all varieties was 13,163, compared with 12,433 in 1933. Forty-nine salmon canneries were licensed by the provincial government during the year, the same number as in 1933.

## ENGINEERING BRANCH

The activities of the Engineering Branch included the examination and clearing of obstructions from twenty-five salmon streams along the coast of British Columbia. Work of this kind, which is very important work, necessitates considerable travelling and consumes much time, although the actual expense in clearing operations is sometimes not great. Repair work at eight of the hatcheries operated by the department received attention from the Engineering Branch. In these cases, also, the work takes up considerable time owing to the inaccessible points at which a number of the establishments are situated.

Carrying out the department's policy of assisting rod and gun clubs in their sport fish retaining pond operations, advice and other assistance was given organizations of this kind by the engineers. Technical advice was also given the Provincial Game Board from time to time, at no cost to the department. Work of the branch also included assistance to the Biological Board, examination of areas in the interior with a view to rectifying fishery conditions resulting from various causes, and preparation of plans for contemplated developments.

## ANNUAL MEETING OF FISHERY OFFICES

Owing to the necessity for rigid economy, it was felt desirable to omit for this year the annual meeting of fishery officers. It is the intention, however, to resume these meetings as soon as may be feasible since discussion on the numerous problems of the fishing industry and administration is found most helpful.

## OBITUARY

During the year the fish cultural service lost one permanent officer by the death of William John Sanson, Hatchery Assistant at Kennedy Lake hatchery. He entered the service on August 1, 1926.

## STAFF

Those employed in the several branches of the department in British Columbia during the year totalled 446, made up as follows:—

Inspection and clerical service.....	56
Guardians.....	44
Patrolmen and boat crews.....	206
Fish culture.....	125
Removal of obstructions.....	15
Total.....	466

An increase in the number of guardians and patrolmen was necessitated by the more intensive fishing during the year.



## WHOLE PROVINCE—1925 TO 1934

Year	Num- ber of can- neries oper- ated	Number of salmon licences issued				Sockeye	Red Spring	Pink Spring	White Spring	Blue- backs	Steel- heads	Cohoos	Pinks	Chums	Totals
		G.N.	Troll	P.S.	D.S.	T.N.									
1925	65	4,225	1,821	329	37	19	32,643	4,419	23,938	10,675	1,996	188,505	445,400	607,904	1,720,622
1926	76	4,750	2,416	445	41	6	336,995	4,177	23,736	18,445	2,165	162,449	772,993	701,962	2,065,198
1927	76	5,637	3,093	555	46	7	308,932	8,819	16,129	20,820	1,746	161,148	247,617	562,109	1,360,449
1928	62	5,179	2,987	399	22	7	203,541	2,328	5,526	6,073	865	150,684	792,362	863,256	2,035,637
1929	63	5,609	2,630	371	24	7	281,306	3,156	7,926	22,246	672	174,198	477,969	424,982	1,400,750
1930	59	6,061	3,115	343	21	7	477,678	6,550	11,970	42,033	1,656	148,561	1,111,937	401,114	2,221,783
1931	35	4,893	3,115	298	21	7	291,464	4,727	4,894	25,296	1,326	76,879	206,995	55,977	685,104
1932	44	5,359	3,033	157	30	7	284,355	14,133	14,874	28,505	1,168	160,466	223,716	306,761	1,081,031
1933	49	6,113	2,880	228	31	8	258,107	1,849	5,953	21,763	1,459	137,289	532,558	293,630	1,265,072
1934	49	6,826	3,099	296	9	8	377,882	1,644	12,859	29,556	1,282	195,874	435,364	513,184	1,582,926

NOTE.—Licences issued include transfers from one district to another, except in the case of purse seines in 1930 and 1931.

STATEMENT No. 2

## PACK OF CANNED SALMON ON THE NAAS RIVER—1925 TO 1934

Year	Num-ber of can-neries oper-ated	Number of salmon licences issued				Sockeye	Red Spring	Pink Spring	White Spring	Blue-backs	Steel-heads	Cohoos	Pinks	Chums	Totals
		G.N.	Troll	P.S.	D.S.	T.N.									
*1925.....	3	210					5,441	387	538		470	8,188	35,880	23,497	94,752
†1925.....							4,067	387	392		457	7,726	34,530	22,504	89,008
*1926.....	4	316					4,616	751	597		372	4,274	43,891	15,392	85,825
†1926.....							4,616	751	597		375	4,274	50,815	15,392	92,749
*1927.....	4	302					3,221	511	213		96	3,845	16,009	3,307	39,788
†1927.....							3,221	511	213		96	3,845	16,009	3,307	39,788
*1928.....	3	263					1,471	68	615		36	18,002	95,998	4,591	126,339
†1928.....							1,471	68	307		36	10,734	83,183	3,538	104,877
*1929.....	3	240					256	57	96			1,195	10,507	1,261	29,669
†1929.....							256	57	96			1,145	10,342	1,212	29,185
*1930.....	3	282					1,772	283	176		137	5,555	90,163	4,330	128,916
†1930.....							1,722	283	176		84	961	79,976	3,853	113,460
*1931.....	1	235					1,010	323	106			8,943	5,178	660	33,149
†1931.....							1,010	323	106			443	3,575	392	14,995
*1932.....	3	278					5,848	264	468		23	33,495	51,920	15,070	122,226
†1932.....							3,676	264	468		10	7,955	44,629	14,515	85,671
*1933.....	3	297					1,014	227	214		114	19,016	57,406	2,778	90,942
†1933.....							885	227	184		49	3,251	44,306	1,775	60,434
*1934.....	3	335					533	126	145		311	26,698	37,698	5,558	107,311
†1934.....							383	126	145		311	9,935	32,965	2,648	75,214

NOTE.—Licences issued 1926-1931 include transfers from other districts.

\*Pack of fish caught at Naas River regardless where canned. †Pack at Naas River regardless where caught.

## PACK OF CANNED SALMON ON THE SKEENA RIVER—1925 TO 1934

STATEMENT No. 3

Year	Num-ber of can-neries oper-ated	Number of salmon licences issued				Sockeye	Red Spring	Pink Spring	White Spring	Blue-backs	Steel-heads	Cohoes	Pinks	Chums	Totals
		G.N.	Troll	P.S.	D.S.	T.N.									
†1925.....	13	1,067	.....	.....	.....	.....	77,785	17,811	1,657	2,457	700	38,029	127,226	10,687	276,352
†1925.....	.....	.....	.....	.....	.....	.....	81,149	19,185	1,657	2,603	713	39,168	130,083	74,308	348,866
†1926.....	15	1,129	.....	.....	.....	.....	82,307	17,896	966	1,750	764	30,153	170,586	46,382	350,804
†1926.....	.....	.....	.....	.....	.....	.....	82,357	17,896	966	1,750	764	30,209	210,064	63,527	407,533
†1927.....	13	1,195	.....	.....	.....	.....	83,988	13,595	3,567	1,609	646	25,209	38,903	9,656	177,173
†1927.....	.....	.....	.....	.....	.....	.....	83,984	14,856	3,567	1,609	580	25,623	38,761	18,659	187,639
†1928.....	11	1,208	.....	.....	.....	.....	34,524	4,121	988	337	231	18,751	191,812	11,792	262,616
†1928.....	.....	.....	.....	.....	.....	.....	34,559	5,043	988	354	241	30,194	209,579	17,751	298,709
†1929.....	11	1,143	.....	.....	.....	.....	77,714	3,795	441	383	13	37,138	94,846	3,625	217,955
†1929.....	.....	.....	.....	.....	.....	.....	78,014	3,795	441	383	13	37,456	95,305	4,835	220,242
†1930.....	11	1,202	.....	.....	.....	.....	130,952	6,589	1,047	322	60	24,191	214,266	3,327	330,754
†1930.....	.....	.....	.....	.....	.....	.....	132,372	6,674	1,047	324	58	29,203	275,642	5,057	450,377
†1931.....	8	1,076	.....	.....	.....	.....	107,936	7,040	2,284	534	768	20,146	41,264	3,893	183,865
†1931.....	.....	.....	.....	.....	.....	.....	93,029	7,040	2,284	534	768	10,737	44,807	3,610	162,809
†1932.....	10	1,119	.....	.....	.....	.....	59,916	16,378	9,419	2,472	404	48,312	58,261	38,549	233,711
†1932.....	.....	.....	.....	.....	.....	.....	52,624	14,268	9,419	2,472	365	20,549	32,519	28,756	160,972
†1933.....	10	1,218	.....	.....	.....	.....	30,506	2,626	444	227	267	39,896	95,783	15,714	185,463
†1933.....	.....	.....	.....	.....	.....	.....	27,693	6,805	444	828	201	21,366	79,932	10,970	148,239
†1934.....	9	1,164	.....	.....	.....	.....	70,654	6,844	592	860	114	54,470	125,163	24,388	283,085
†1934.....	.....	.....	.....	.....	.....	.....	54,558	6,809	592	860	131	21,298	27,628	6,242	118,118

†Pack of fish caught at Skeena River regardless where canned,  
NOTE.—Licences issued include transfers from other districts.

‡Pack at Skeena River regardless where caught.



PACK OF CANNED SALMON FROM FISH CAUGHT AT RIVERS INLET AND SMITHS INLET—1925 TO 1934

STATEMENT No. 4

Year	Num- ber of can- neries oper- ated	Number of salmon licences issued				Sockeye	Red Spring	Pink Spring	White Spring	Blue- backs	Steel- heads	Cohoes	Pinks	Chums	Totals
		G.N.	Troll	P.S.	D.S.	T.N.									
1925	11	1,127					201,186	344	116		10	4,887	7,675	11,501	226,030
1926							170,581	311	57			4,866	8,625	11,477	196,132
1926	12	1,483					89,866	535	160		27	10,348	8,493	14,690	134,341
1926							74,629	473	142		11	7,448	13,503	11,751	108,146
1927	13	1,842					101,053	530	321		19	5,475	1,383	5,027	114,271
1927							87,145	530	321		17	4,990	1,402	3,617	98,534
1928	11	1,541					93,361	458	157		13	9,761	3,130	9,200	116,523
1928							88,375	443	152		13	1,098	16,703	3,626	111,066
1929	13	1,577					79,548	546	127		47	8,270	3,112	6,536	98,401
1929							77,669	164	107		41	1,340	1,340	1,091	88,866
1930	12	1,833					150,398	614	229		182	6,760	17,476	18,372	194,414
1930							141,684	275	215		208	2,084	34,638	2,135	181,622
1931	5	1,433					92,872	218	183		69	5,536	2,296	544	101,779
1931							80,732	200	165		68	6,683	3,724	563	92,216
1932	10	1,754					86,110	405	145		56	11,871	4,305	5,516	108,644
1933							85,358	128	123		49	7,335	4,631	1,109	98,989
1933	11	1,962					119,548	606	243		153	9,078	11,658	8,932	150,326
1933							114,045	454	241		169	8,514	25,054	9,518	158,103
1934	8	2,318					89,575	532	129		121	11,862	2,928	14,375	119,604
1934							82,828	390	198		122	8,793	9,769	16,444	118,556

NOTE.—Figures shown in roman are packs from fish caught at Rivers Inlet or Smiths Inlet. Figures shown in italics, 1925 to 1934, are actual packs irrespective of where fish taken and not including fish shipped out for canning in other districts.

NOTE.—Licences issued include transfers from other districts.

## PACKS OF SALMON IN FRASER RIVER DISTRICT 1925 TO 1934

STATEMENT No. 5

Year	Number canneries operated	Number salmon licences operated		Sockeye	Red Spring	Pink Spring	White Spring	Blue- backs	Steel- heads	Cohoe	Pinks	Chums	
		G. N.	Troll   P. S.										
*1925.....	10	969	50	31,523	7,335	873	25,482	5,107	45	36,717	99,800	66,111	272,993
†1925.....				31,182	7,335	873	25,482	3,332		32,964	96,828	51,934	249,940
*1926.....	10	1,063	59	83,589	11,774	1,030	20,130	14,036	39	21,787	32,256	88,493	273,134
†1926.....				82,734	11,166	1,024	19,910	206		13,201	1,374	38,816	168,431
*1927.....	10	1,249	111	57,085	6,553	1,351	10,493	10,621	37	24,079	102,535	67,259	280,013
†1927.....				56,730	6,474	1,351	10,374	5,709		19,481	98,483	53,297	251,899
*1928.....	8	1,303	109	26,530	1,173	248	3,661	795		27,061	2,881	193,106	235,455
†1928.....				25,715	671	119	3,146	795		21,825	67	142,368	194,706
*1929.....	9	1,473	113	60,407	2,984	912	5,977	11,960	53	40,540	158,290	144,208	425,131
†1929.....				54,717	2,615	662	4,688	11,960		25,203	139,840	81,860	321,545
*1930.....	8	1,523	115	107,896	8,300	3,066	9,761	27,857	22	25,535	30,754	68,946	282,137
†1930.....				93,416	7,610	2,106	7,574	752		7,168	937	27,061	147,524
*1931.....	7	1,358	154	54,688	5,970	1,185	3,187	14,697		13,468	21,534	948	115,681
†1931.....				38,507	5,926	909	2,883	653	4	8,153	13,307	246	70,584
*1932.....	8	1,446	166	83,447	19,994	3,622	11,020	16,558	23	28,685	9,813	45,100	212,286
†1932.....				61,759	14,774	3,420	10,481	1,259		16,569		14,014	122,362
*1933.....	10	1,685	110	53,481	5,701	426	4,554	13,299		25,715	143,058	77,330	323,564
†1933.....				43,745	1,151	261	4,167	83		13,904	92,769	34,391	190,471
*1934.....	11	1,803	98	145,579	5,495	263	11,072	22,566		30,751	35,847	219,331	470,904
†1934.....				133,159	4,713	173	10,760	1,607		10,991	342	103,081	204,826

NOTE.—Licences issued include transfers from other districts.

\*Represents actual pack, regardless where caught.

†Represents pack of Fraser fish, regardless where canned.

## STATEMENT No. 6

## PACK OF CANNED SALMON OF PUGET SOUND FROM 1925 TO 1934

Year	Number of canneries operated	Spring	Sockeye	Cohoe	Chum	Pink	Steel- head	Total
1925.....	23	28, 268	106, 064	171, 587	41, 635	555, 848	141	903, 543
1926.....	14	27, 763	44, 569	120, 846	112, 411	2, 125	63	307, 778
1927.....	21	43, 443	96, 343	133, 528	37, 414	585, 506	216	896, 450
1928.....	12	24, 628	61, 044	92, 770	145, 735	5, 816	265	330, 258
1929.....	21	32, 600	111, 855	101, 363	150, 867	727, 748	280	1, 124, 715
1930.....	13	29, 378	352, 194	122, 691	64, 234	3, 712	397	572, 606
1931.....	18	28, 066	83, 728	76, 025	55, 189	705, 580	293	948, 881
1932.....	10	23, 964	78, 319	60, 740	146, 151	1, 677	60	310, 911
1933.....	19	20, 869	125, 738	44, 568	37, 039	543, 340	222	771, 776
1934.....	20	14, 398	352, 579	69, 254	73, 337	3, 606	.....	513, 174

## STATEMENT No. 7

STATEMENT OF HALIBUT LANDINGS—BRITISH COLUMBIA  
1913 TO 1934

	Cwt.		Cwt.
1913.....	223, 465	1924.....	331, 382
1914.....	214, 444	1925.....	318, 240
1915.....	194, 896	1926.....	315, 095
1916.....	123, 062	1927.....	271, 354
1917.....	113, 529	1928.....	302, 820
1918.....	186, 229	1929.....	304, 364
1919.....	210, 777	1930.....	254, 796
1920.....	238, 770	1931.....	182, 005
1921.....	325, 868	1932.....	168, 847
1922.....	293, 184	1933.....	170, 372
1923.....	334, 667	1934.....	182, 602

## STATEMENT No. 8

## STATEMENT OF DRY SALT HERRING PACKS, 1918-1934—BRITISH COLUMBIA

Year	District No. 1	District No. 2	District No. 3		Total
			East Coast	West Coast	
	cwt.	cwt.	cwt.	cwt.	cwt.
1918.....	20, 000	.....	109, 900	42, 710	172, 610
1919.....	4, 000	.....	43, 000	208, 058	255, 058
1920.....	807	1	176, 640	334, 720	512, 168
1921.....	249	.....	231, 240	248, 482	479, 971
1922.....	.....	.....	297, 871	224, 897	522, 768
1923.....	.....	8, 935	250, 420	484, 681	744, 036
1924.....	.....	.....	305, 266	548, 277	853, 543
1925.....	.....	4, 120	591, 162	487, 892	1, 083, 174
1926.....	11, 134	4, 192	596, 114	327, 207	938, 647
1927.....	24, 380	7, 600	542, 385	473, 825	1, 048, 190
1928.....	46, 995	.....	748, 032	277, 161	1, 072, 188
1929.....	78, 800	5, 160	691, 673	140, 751	916, 384
1930.....	19, 114	.....	546, 342	240, 517	805, 973
1931.....	.....	.....	668, 506	119, 721	788, 227
1932.....	.....	.....	219, 398	50, 022	269, 420
1933.....	.....	.....	448, 944	64, 080	513, 024
1934.....	.....	.....	310, 026	104, 600	414, 626

## STATEMENT No. 9

CANNED PILCHARD PACK—BRITISH COLUMBIA  
1917 TO 1934

	Cases		Cases
1917.....	1, 090	1926.....	26, 731
1918.....	63, 693	1927.....	58, 501
1919.....	63, 065	1928.....	65, 097
1920.....	91, 929	1929.....	98, 821
1921.....	16, 091	1930.....	55, 166
1922.....	19, 186	1931.....	17, 336
1923.....	17, 195	1932.....	4, 622
1924.....	14, 898	1933.....	2, 946
1925.....	37, 182	1934.....	35, 437



## DEPARTMENT OF FISHERIES

## STATEMENT No. 10

## PRODUCTION FISH OIL AND MEAL—BRITISH COLUMBIA, 1920-1934

Year	From Pilchards		From Herring		From Whales			From Other Sources	
	Meal and fertilizer	Oil	Meal	Oil	Whale-bone and meal	Fertilizer	Oil	Meal and fertilizer	Oil
	tons	gals.	tons	gals.	tons	tons	gals.	tons	gals.
1920.....					503	1,035	604,070	466	55,669
1921.....								489	44,700
1922.....					326	230	283,314	911	75,461
1923.....					485	910	706,514	823	180,318
1924.....					292	926	645,657	1,709	241,376
1925.....	2,083	495,653			347	835	556,939	2,468	354,853
1926.....	8,481	1,898,721	310	13,700	340	666	468,206	1,752	217,150
1927.....	12,169	2,673,876	1,838	170,450	345	651	437,967	2,512	375,130
1928.....	14,500	3,995,806	831	68,411	376	754	571,914	3,658	411,207
1929.....	15,826	2,856,579	392	34,924	416	779	712,597	3,671	461,915
1930.....	13,934	3,204,053	915	60,373	273	581	525,533	2,420	182,636
1931.....	14,200	2,551,914	3,904	110,810				1,747	241,682
1932.....	8,842	1,315,864	6,195	186,173				413	45,517
1933.....	1,108	275,879	4,078	316,213	249	223	509,310	1,596	187,560
1934.....	7,626	1,635,123	2,570	104,710	340	631	813,724	2,458	837,025

## STATEMENT No. 11

## WHALE CATCH LANDINGS, BRITISH COLUMBIA, 1922-1934

Species	1922	1923	1924	1925	1926	1927	1928	1929	1930	1933	1934
Sperm.....	38	94	83	76	80	82	83	146	147	190	265
Sulphur.....	4	62	56	29	14	10	47	16	10	1	.....
Fin.....	94	166	125	135	124	138	140	168	62	17	71
Hump.....	50	78	47	40	25	21	21	9	12	.....	14
Sei.....	1	53	100	68	25	7	13	67	89	1	.....
Right.....			2		1						.....
Pottlenose.....		2	1	3			1	1			.....
Gray.....											.....
Totals.....	187	455	414	351	269	258	305	407	320	209	350

No whaling plants operated 1931 and 1932.

## STATEMENT No. 12

STATEMENT OF FUR SEAL SKINS TAKEN AND LANDED BRITISH COLUMBIA, 1912-1934,  
BY CANADIAN INDIANS UNDER ARTICLE IV OF THE PELAGIC SEALING TREATY

Year	*District No. 2	District No. 3	Total
1912.....		205	205
1913.....	285	119	404
1914.....	95	257	352
1915.....	39	400	439
1916.....	21	138	159
1917.....	14	204	218
1918.....	78	10	88
1919.....	53	17	70
1920.....	502	556	1,058
1921.....	270	2,079	2,349
1922.....	291	639	930
1923.....	678	3,746	4,424
1924.....	370	1,862	2,232
1925.....	810	3,655	4,465
1926.....	655	2,169	2,824
1927.....	188	1,288	1,476
1928.....	465	1,625	2,090
1929.....	1,119	2,264	3,383
1930.....	195	2,102	2,297
1931.....	76	1,387	1,463
1932.....	88	1,699	1,787
1933.....	237	1,747	1,984
1934.....	98	158	256

\*No fur seals taken in District No. 1.

## STATEMENT No. 13

## STATEMENT OF SALMON LICENCES ISSUED—BRITISH COLUMBIA, 1919-1934

Kind of Licence	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
<i>District No. 1—</i>																
Salmon cannery.....	14	11	13	10	11	9	10	10	10	10	9	11	7	8	10	11
Salmon gill-net.....	1,337	1,288	1,437	1,296	964	969	969	1,063	1,249	1,303	1,473	1,523	1,358	1,446	1,685	1,803
<i>District No. 2—</i>																
Salmon cannery.....	45	41	32	41	37	38	41	50	48	47	45	26	21	28	29	31
Salmon purse-seine.....	35	79	13	73	126	107	137	193	244	158	153	152	71	53	55	109
Salmon drag-seine.....	81	38	30	30	20	19	15	14	16	9	9	9	9	9	11	9
Salmon gill-net:—																
Naas River.....	300	342	338	304	244	210	210	316	302	263	246	282	235	278	297	335
Skeena River.....	1,153	1,153	1,109	1,091	900	941	1,068	1,129	1,198	1,208	1,143	1,202	1,076	1,119	1,218	1,164
Rivers Inlet.....		871	1,000	1,012	987	770	891	1,115	1,273	1,117	1,149	1,449	1,144	1,461	1,603	1,699
Smiths Inlet.....	916	373	215	179	197	193	236	368	570	424	428	384	289	293	359	419
Bella Coola.....		193	241	165	134	146	139	192	195	173	236	359	240	238	228	285
Kimsquit.....				120	122	96	137	100	104	80	194	71	51	55	43	48
Butedale.....	421	61	5		63	32	60	37	108	58	56	142	108	100	107	141
Namu.....		136	138	136	215	87	109	139	180	77	116	142	108	100	107	141
Queen Charlotte Islands.....		14	1	4	1	1	17	27	42	22	3	6	5	4	2	19
Lowe Inlet.....														29	59	67
Total, District No. 2.	2,490	2,943	3,047	3,011	2,863	2,476	2,867	3,423	3,972	3,422	3,571	3,895	3,148	3,577	3,916	4,377
<i>District No. 3—</i>																
Salmon cannery.....	23	13	11	14	13	15	16	19	18	19	17	17	7	8	10	7
Salmon purse-seine.....	103	76	46	74	97	135	192	252	308	239	218	191	157	104	183	187
Salmon drag-seine.....	23	7	5	10	11	13	22	27	30	13	13	12	12	21	20	.....
Salmon gill-net.....	771	530	293	176	142	251	390	364	422	454	565	643	387	336	512	646
<i>Whole Province—</i>																
Salmon cannery.....	82	65	56	65	61	62	67	79	76	76	71	84	35	44	49	49
Salmon purse-seine.....	138	155	59	147	223	242	329	445	552	397	371	243	228	157	238	296
Salmon drag-seine.....	104	45	35	40	31	32	37	41	46	22	22	21	21	30	31	9
Salmon gill-net.....	4,598	4,761	4,777	4,483	3,969	3,696	4,226	4,850	5,643	5,179	5,609	6,061	4,893	5,359	6,113	6,826

## STATEMENT No. 14

## STATEMENT OF POWER BOATS OPERATED IN DISTRICT No. 2, BRITISH COLUMBIA, IN CONNECTION WITH SALMON GILLNET OPERATIONS

—	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
Naas river.....	3	9	35	21	37	34	119	142	179	223	268
Skeena river.....	18	64	133	162	216	263	472	603	660	668	732
Bella Coola and Kimsquit.....	1	12	49	47	90	70	124	94	89	101	156
Central area.....		8	28	87	13	103		68	111	165	234
Rivers Inlet.....	54	110	254	248	479	435	712	682	776	901	1,233
Smiths Inlet.....	9	39	131	110	204	135	231	176	175	219	299
Queen Charlotte Islands.....					10						
	85	242	630	675	1,049	1,010	1,658	1,765	1,990	2,287	2,922

## STATEMENT No. 15

## PACK OF SOCKEYE SALMON FROM RUNS TO FRASER RIVER, 1925-1934

Year	Fraser river canneries	Canadian traps in Juan de Fuca Straits	Puget Sound canneries	Total
1925.....	31,523	3,862	106,064	141,449
1926.....	83,589	2,091	44,569	130,249
1927.....	57,085	4,337	96,343	157,765
1928.....	26,530	2,769	61,044	90,343
1929.....	60,407	3,480	111,856	175,743
1930.....	93,416*	5,334	352,194	450,944
1931.....	38,507*	2,440	83,728	124,675
1932.....	61,679*	4,000	78,319	144,088
1933.....	43,745*	8,721	125,738	178,204
1934.....	133,159*	6,117	352,579	491,855

\*Does not include Sockeye canned on Fraser and caught in other districts.

NOTE.—A statement showing the yearly figures from 1876 to 1920 will be found in the departmental report for 1930-31.

NOTE.—Fraser River canneries include 5,643 cases Sockeye caught on Fraser river and canned in other districts, in 1934.

## DEPARTMENT OF FISHERIES

## STATEMENT No. 16

## STATEMENT OF FISHERY LICENCES ISSUED—BRITISH COLUMBIA—SEASON 1934-35

Variety	Issued				Transfers			Operating				
	White	Indian	Others	Jap. R.S.	Can- celled	Total	White	Indian	Others	Jap. R.S.	Can- celled	Total
Salmon trap-net.....	8	9	.....	.....	.....	8	8	9	.....	.....	.....	8
Salmon drag-seine.....	224	70	.....	.....	.....	296	224	70	.....	.....	.....	296
Salmon purse-seine.....	3,159	1,217	910	1	1	5,438	4,255	1,451	910	93	1	6,826
Salmon gill-net.....	2,296	580	155	65	87	3,045	2,347	583	155	5	87	3,099
Salmon trolling.....	245	349	604	.....	.....	1,210	245	349	604	.....	.....	1,210
Asst. salmon gill-net.....	48	86	.....	.....	.....	135	48	86	.....	.....	.....	135
Capt. salmon seine.....	991	660	.....	6	1	1,657	991	660	.....	6	1	1,657
Asst. salmon seine.....	3	.....	7	1	.....	11	3	.....	7	.....	.....	11
Abalone.....	205	22	146	1	7	381	205	22	146	1	7	381
Cod.....	83	16	1	.....	.....	100	83	16	1	.....	.....	100
Crab.....	31	1	119	1	.....	152	31	1	119	1	.....	152
Gray fish.....	67	8	31	3	2	111	67	8	31	3	2	111
Miscellaneous.....	14	.....	8	.....	.....	23	14	.....	8	.....	.....	23
Small dragger.....	38	1	14	2	3	58	38	1	14	2	3	58
Smelt.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Capt. halibut boat for bait.....	11	.....	.....	.....	.....	11	11	.....	.....	.....	.....	11
Herring pound.....	9	.....	.....	.....	.....	9	9	.....	.....	.....	.....	9
Herring purse-seine.....	17	.....	3	1	.....	21	17	.....	3	1	.....	21
Herring gill-net.....	9	.....	7	.....	.....	16	9	.....	7	.....	.....	16
Capt. herring seine.....	8	.....	4	.....	.....	12	8	.....	4	.....	.....	12
Asst. herring seine.....	118	48	120	.....	.....	286	118	48	120	.....	.....	286
Pilchard purse-seine.....	21	.....	.....	.....	.....	21	21	.....	.....	.....	.....	21
Capt. pilchard seine.....	16	2	.....	.....	.....	18	16	2	.....	.....	.....	18
Asst. pilchard seine.....	125	10	.....	.....	.....	135	125	10	.....	.....	.....	135
Totals.....	7,746	3,079	2,129	86	123	13,103	1,177	237	2,129	114	123	14,605

Angling permits, 1,474.

Indian permits, 2,103.

## LICENCES ISSUED BY PROVINCIAL GOVERNMENT

Salmon cannery.....	49
Salmon dry saltery.....	15
Herring dry saltery.....	25 (15 operated)
Pilchard reduction plants.....	6



## STATEMENT No. 17

STATEMENT OF NUMBERS OF DIFFERENT SPECIES OF SALMON AND METHOD OF CAPTURE REPORTED BY OPERATORS OF SALMON PURSE-SEINES, DRAG-SEINES, AND TRAP-NETS, AND BY SALMON CANNING, CURING, AND COLD STORAGE ESTABLISHMENTS, OF GILL-NET AND TROLL CAUGHT FISH—BRITISH COLUMBIA—1934

—	Sockeye	Springs	Blue-backs	Steel-heads	Cohoe	Pinks	Chums	Total
Troll.....		1,350,636	515,766	343	2,542,724	273	819	4,410,561
Gill-net.....	3,782,889	333,466	26,507	69,604	792,049	2,328,694	1,778,929	9,112,138
Purse-seines.....	710,212	26,531	4,000	1,633	278,219	6,952,477	3,053,618	11,026,690
Drag-seines.....	22,365				7,570	7,115	583	37,633
Trap-nets.....	68,748	26,710	85	1,134	32,310	546	6,687	136,220
Totals.....	4,584,214	1,737,343	546,358	72,714	3,652,872	9,289,105	4,840,636	24,723,242

## STATEMENT No. 18

STATEMENT OF SALMON CAUGHT BY PURSE-SEINES, SHOWN BY SEINING AREAS, SEASON 1934

Area No.	Sockeye	Springs	Blue-backs	Steel-head	Cohoe	Pink	Chum	Total
1.....	7,170	62		1	1,543	1,122,717	94,608	1,226,101
2.....					21,357	282,780	477,725	781,862
3.....	7,235	421		35	4,281	461,082	32,399	505,453
4.....	76				94	25,319	1,176	26,665
5.....	25,930	19		18	28,796	782,393	3,894	841,050
6.....	29,776	249		136	44,731	1,460,291	101,262	1,636,445
7.....	28,948	231		120	34,107	212,102	344,640	620,148
8.....	10,529	204		63	9,422	121,774	48,300	190,292
9.....					59	20	1,784	1,863
10.....	4				1,384	1,017	73,837	76,242
11.....		2			2,074		21,874	23,950
12.....	105,637	3,171	177	826	47,523	1,847,544	182,746	2,187,624
13.....	11,666	1,004	3,823	53	13,069	549,248	423,378	1,002,241
14.....	311	154			2,950	30	198,127	201,572
15.....					262		20,972	21,234
16.....	363				530		89,115	90,008
17.....	328,058	19,835		13	7,723	48	21,235	376,912
18.....	45,317	103		1	814	1,222	39,160	86,617
19.....	1	2			40		4,683	4,726
20.....								
21.....	7,797	137		3	7,527	1	58,739	74,204
22.....					5,149	340	167,154	172,643
23.....	31,287	901		275	6,835		153,879	193,177
24.....	59,144	20		88	12,296		110,663	182,211
25.....	135				9,262	12,123	168,272	189,792
26.....	2,655				2,636	11,900	146,738	163,929
27.....	8,173	16		1	13,755	60,526	67,258	149,729
Totals..	710,212	26,531	4,000	1,633	278,219	6,952,477	3,053,618	11,026,690

## REPORT ON SALMON SPAWNING GROUNDS, 1934

## QUEEN CHARLOTTE ISLAND

This is primarily a fall salmon area although a few sockeye run to Massett inlet each year. This run, however, is not important.

It will be remembered that in 1932 what had been, as long as records are available, an enormous run of pink salmon, returned in very small quantities. The run in 1930 was heavy, and although comparatively lightly fished, the seeding in 1932, for no known reason, was only approximately twenty per cent. During the season under review early precautions were taken to see that a good portion of the run would be enabled to pass to the spawning grounds and the result was that all areas in Massett inlet, including the Yakoun river and

Justkatla inlet, were heavily seeded with pink salmon eggs and the previous satisfactory conditions appear to have been restored. Early closing at Naden harbour also provided a satisfactory escapement of pinks to the spawning grounds in that district.

The seeding of the streams on the east coast of the Queen Charlotte islands cannot be considered as satisfactory, although an extra effort was made to see that adequate quantities passed upstream. Skeedans creek was an exception; a good seeding occurred there and a reasonably good one at Tl-ell river.

The coho run generally in this area was one of the most satisfactory in recent years.

The chum seeding generally has been fairly satisfactory, although there are several streams where conditions have not been quite as good as could be desired.

#### NAAS RIVER

The seeding by the early run of sockeye is reported as heavy and similar to that of the seasons 1929 and 1930 and an improvement over the seeding of 1933. The late run was also good, very similar to that of 1929.

The coho run was also satisfactory but the number of springs observed was not up to the average.

Satisfactory quantities of pinks were found in the spawning areas of the river and its tributaries. This run, in addition to being heavy, was very late in arriving.

The supply of pinks was satisfactory in the area from the mouth of the Naas river to Dixon entrance, including the Khutzeymateen river.

The chum supply was not as good as could be desired.

A jam was removed from the entrance to the fishway at Meziaden lake and this structure was left in good condition.

#### SKEENA RIVER

In view of the small commercial catch of sockeye it was not expected that any large quantity would be observed on the spawning grounds but the supply was not as unsatisfactory as feared. In the Babine river the run cannot be considered as satisfactory, but conditions in this stream have varied from year to year over a very considerable period. The lower portion of the river, however, received a very good seeding, better than in 1933.

At Morrison creek, on which the hatchery is situated, the supply of spawning sockeye was the largest in the past four years, according to the hatchery superintendent. In the hatchery operations approximately seventy-five per cent of the fish were spawned, providing a collection of 3,730,000 eggs. The remainder were permitted to spawn naturally. Males exceeded females in the ratio of six to one, at this point.

The situation at Fulton river seems to have been more satisfactory and the seeding should prove reasonably adequate, although the number of fish was less than in the brood years, 1929 and 1930.

At Pierre, Twin and 15 Mile creeks the seeding would appear to be reasonably satisfactory.

Taking the Babine area as a whole, conditions were not found to be as bad as might have been expected but the quantity of spawning sockeye observed cannot be considered as adequate, having in mind the large quantities appearing on these spawning grounds in previous years.

The quantities of springs, cohoes and pinks in the Babine area do not appear to have been particularly satisfactory.

In the Lakelse Lake system the return of sockeye was larger than in 1930, and compared very favourably with the record year of 1926.

The supply of spawning pinks was found to be adequate.



## GRENVILLE-PRINCIPE AREA

Apart from Lowe inlet, the sockeye streams in this area were well supplied with spawning fish. Wet weather conditions, coupled with fishing restrictions, permitted a good escapement. At Lowe inlet precautions are being taken to see that the escapement is more satisfactory in this cycle.

Cohoos were observed in satisfactory quantities throughout the area. The same comment also applies to the pinks. The chum situation was not found to be quite so satisfactory.

## BUTEDALE AREA

The sockeye supply found on the spawning grounds was a reasonably satisfactory one. Weather conditions were favourable during the first of the season but later, due to lack of rain, it was necessary to enforce longer closed times, an action which appears to have obtained the desired results in the way of escapement.

There was a very gratifying escapement of coho, particularly to the northern part of the area.

In the northern section of the area the pink seeding was fairly satisfactory, but farther south the situation was not so good. The condition of the pink run, while not discouraging, was such as to indicate the necessity of some further protection and the necessary measures are being taken.

Owing to the closure of the area to fishing, a fair supply of chum salmon reached the spawning grounds.

The heavy rains resulted in freshets over the area during October but apparently there was no great damage done to the spawning areas.

## BELLA BELLA AREA

As a result of twenty-eight days' extra closed time enforced during the sockeye season, the escapement of this variety to the spawning grounds was found to be very satisfactory. The quantities of coho found were reported as extraordinarily heavy. The pink supply was not so satisfactory, but by extra closures a greater proportion of the run was permitted to reach the spawning grounds.

The chum supply was not as large as could be desired but by exceptional measures in the way of fishing restriction a fair supply was enabled to pass up the streams safely.

## BELLA COOLA AREA

Two trips of inspection were made by seaplane to Kimsquit lake, and two were also made to the upper Bella Coola and Atnarko rivers. The second trip in each case was for the purpose of ascertaining the extent of damage done to the spawning grounds by flood conditions.

The supply of spawning sockeye observed is stated to have been very satisfactory and in fact this remark applies to the pinks and cohoes as well. The chum supply was as good as was expected.

The inspecting officer feels that the quantities of sockeye, pinks, and cohoes observed this year were greater than those seen in the brood years and in the case of chums, spring, and steelhead, the conditions are very similar to those of the brood years.

The situation from a standpoint of floods and freshets was unusually difficult during this fall, particularly in the Bella Coola river, the water rising to levels beyond previous records. Undoubtedly much damage has been done to spawning grounds but probably this damage would be confined largely to the areas used by chum salmon, that is, the lower reaches of the streams. The upper reaches were not so much affected and it is expected that the damage there was not very great. It is estimated that the sockeye will be the least affected by the high water conditions.



## RIVERS INLET AREA

Examinations of Owekano lake and its tributaries would appear to justify the conclusion that the sockeye spawning has been up to average. Several streams have been found lightly seeded but, on the other hand, others have received unusually large supplies; the condition generally is reported as quite satisfactory. One feature of the run was found to be the abnormally large proportion of three-year old males; in fact, in the run, as a whole, the males have considerably exceeded the females in numbers.

The supply of cohoes observed appears to have been unusually good.

The supplies of fall fish generally in the inlets tributary to Rivers inlet appear to be average.

## SMITHS INLET

Two inspections were made of this area and the observations show that most satisfactory conditions in the way of spawning sockeye appear to prevail again, notwithstanding unusually high water. There would appear to be every reason to believe that the sockeye supply at Smiths inlet can be well maintained and possibly increased.

In the Nekite river, at the head of Smiths inlet, there was a light run of pinks and cohoes and a medium run of chums. At the head of the southeast arm, however, a heavy escapement of chums occurred.

In the Takoosh river and Ah-cla-ker-ho channel the conservation measures taken during recent years appear to have been successful in building up the run of chums.

## FRASER RIVER WATERSHED

*Prince George District.*—In the Stuart-Trembleur-Takla Lake section the local officers report that the number of spawning sockeye appearing this year shows an increase over that of four years ago. This is true also as regards the Fraser Lake-Francois Lake section. While this may seem encouraging, yet when one considers the large runs of years ago, the few returning at present would not seem to be particularly significant.

One pleasing factor is that the Indians at the outlet of Stuart lake have not depended this season so much on the sockeye for their food purposes. This is due largely to the very considerable increase in the quantity of moose appearing all through the northern section of the Fraser River watershed. As a result of this situation a larger percentage of ascending runs should in future years escape to the spawning grounds.

In the Quesnel Lake-Bowron Lake sections the quantity of sockeye observed has not been encouraging.

The Chilcotin section is very outstanding in any discussion of the spawning conditions in the Fraser, as there has been a considerable increase shown each cycle for some years past. Whilst it is always impossible to accurately estimate the number of parent fish in any spawning area, yet conditions in Chilco lake are such as to permit the local officer (who has had many years' experience) to quote figures which, used in a comparative way, can be accepted as being fairly indicative of the situation. He suggests the following numbers of spawning sockeye observed for the past seven years:—

1927.....	400
1928.....	20,000
1929.....	70,000
1930.....	900
1931.....	2,500
1932.....	70,000
1933.....	100,000
1934.....	3,500

The returns to the Seton-Anderson Lake system are apparently showing no increase and are not at all encouraging.

*Kamloops District.*—The North Thompson has not been shown to be a particularly valuable spawning area for sockeye but there is a quantity each year found in the Raft river.

On the other hand, the Shuswap area, on the South Thompson, has been most encouraging in recent seasons and this year the number of spawning sockeye found in Adams river and Little river shows an increase of at least twenty-five per cent over the exceptionally good brood year of 1930. No returns were found in Scotch creek or in the stream at the head of Anstey arm and only a few stragglers appeared at Eagle river.

The fish were of unusually large size, a good many running as high as nine pounds in weight. Male fish predominated in the ratio of four to one.

There has been a dam in the Adams river at the outlet of Adams lake for many years. Although there is a fishway at each side of the stream it is felt that conditions have not been entirely satisfactory but last year high water carried away a section of the dam, which is not now being used, and the result is that the sockeye this year had no difficulty in ascending to the lake above and were observed in several of the tributaries.

It is to the Shuswap area that a very large proportion of the late run sockeye to the Fraser system proceed; that is, sockeye entering the Fraser river from the gulf of Georgia after the end of August.

The run of spring salmon to this area was a normal one.

*Hope District.*—Normally there are not many sockeye found spawning in the tributaries of the Fraser between Lytton and Hope and, as a matter of fact, the streams are largely unsuitable for spawning purposes. One exception is Kakawa lake, where four years ago, there was a very considerable run of sockeye, over ninety per cent of which, however, were estimated to be females. Similar conditions obtained this year. Also, in 1930, every little stream between Lytton and Hope was reported to be full of spawning sockeye from the late run, and these conditions were duplicated in 1934.

Conditions at Hells gate all through the season were normal and the ascending fish experienced no more difficulty than previous to the slide of 1913.

*Chilliwack District.*—In the Chilliwack-Cultus Lake section the expected large number of spawning sockeye arrived. In the brood year of 1930 there were counted over the fence at Cultus lake 10,395 sockeye. This year the number was 19,048.

*Harrison Lake-Pemberton District.*—One of the most satisfactory runs of sockeye in recent years appeared at Morris lake, which at one time was the most prolific producer of sockeye in the Harrison area. The number appearing in the Pemberton area, however, was below expectations, but as a result of the recent arrangements with the officers of the Department of Indian Affairs and special protective measures, there was no question as to there being any molestation of the fish on their way upstream. The Indians obtained only a very small percentage of the run.

The collection of eggs at the Pemberton hatchery amounted to 20,400,000.

Apparently very few sockeye ascended past the hatchery fence after its removal but below that point, for a distance of one and one-quarter miles the Birkenhead river was fairly well seeded naturally.

*Pitt Lake District.*—This watershed received a heavy seeding of sockeye. The hatchery was quickly filled to capacity and it is estimated that not more than ten per cent of the run was used for this purpose, the rest being permitted to spawn naturally.

It was discovered late in the season that a portion of the late run sockeye were spawning in the Pitt river below Pitt lake.



*Howe Sound District.*—In the Howe Sound district the spawning streams contained large numbers of cohoes and chums and a satisfactory proportion of springs. The unusually large quantities of the first two species, however, were quite noticeable.

*General.*—A special effort was made to follow the late run of sockeye in order that a complete report might be available as to all the streams used for spawning purposes. An experienced officer was placed in charge of this investigation and found definitely that no portion of the late run passed above the Bridge River rapids in the Fraser or into the North Thompson river. The principal areas populated by this late run are the Shuswap, Kakawa lake, Cultus lake, Chilliwack lake, and most of the tributary streams between Lytton and Hope, although conditions here are apparently not favourable. A portion also proceeded to the Pitt River area.

#### *Alert Bay Subdistrict*

*Sockeye.*—A satisfactory run of sockeye occurred at Nimpkish river, and due to the abolition of drag-seines from the river, and favourable water conditions during the run, the proportionate escapement was larger than in previous years. The numbers of sockeye appearing on the spawning grounds of Nimpkish lake and in the streams and lakes tributary thereto are reported to have been larger than for many years.

Normal small runs of sockeye occurred at Glendale cove, Thompson sound, Port Neville, Shushartie and Nahwitti rivers. The run to Mackenzie Sound stream, which is Keogh river, was better than usual.

*Springs.*—While the run of springs to Nimpkish river was light, the seeding was quite satisfactory as springs were not fished to any extent in that locality. The runs to Kingcome and Knight inlets were normal, and it is considered that satisfactory numbers ascended the streams to spawn.

*Coho.*—All streams throughout the Alert Bay district frequented by cohoes were well seeded, and the inspector reports that the run was the best for several years—and much heavier than in the brood year.

*Pinks.*—Spawning conditions were very satisfactory throughout, and the number of parent salmon appearing on the spawning grounds compares very favourably with the number in the brood year of 1932. Runs were particularly heavy at Glendale cove and Adams river.

*Chums.*—This run was considered the best since the brood year of 1930, in comparison with which it was about equal. All streams of the subdistrict are well seeded with this variety.

*Steelheads.*—The inspector reports that from information received the run this year appeared to have been the best for several years. As steelheads are not fished commercially to any extent a good seeding of all the streams frequented by them is assured.

#### *Quathiaski Subdistrict*

*Sockeye.*—For the fifth year in succession the sockeye run to Hayden bay has been disappointing. Special closure of fishing was put into effect from June 21st until July 15th this year and, as a result, the escapement to the spawning grounds was greater than for several years past. The run to Phillips arm was light, but as high water occurred during the peak of the run the greater percentage of sockeye ascended Phillips river to the spawning grounds. The inspector states that the run could be considered to be equal to that of the brood year.



*Coho*.—Quantities of this salmon were on the spawning grounds equal to the brood year. The run throughout the district was a good average one.

*Springs*.—The run to Campbell river was considered better than the average, and the number ascending to the spawning grounds there is reported by the inspector to have been heavier than for several years. A good average run ascended Phillips river.

*Pinks*.—An excellent run occurred throughout the whole of the district, and all streams were fully as well seeded as in the brood year.

*Chums*.—Good runs occurred everywhere, the escapement was large, and all streams were at least as well seeded as in the brood year. The run continued much later than usual, and fresh fish ascended many of the streams long after fishing operations ceased.

*Steelheads*.—The supply of these is being well maintained. They appear to be present in all streams frequented by them just as numerous as usual.

*Comox Subdistrict*

The Comox Subdistrict is not a sockeye area.

*Cohoes*.—The run of cohoes throughout the district generally was noticeably heavier than for several years. They appeared on the spawning grounds in larger numbers than during the brood year.

*Springs*.—An excellent run occurred in the Puntledge river, and the numbers on the spawning grounds were reported by the inspector as greater than last year, and greater than for several previous years.

*Pinks*.—They appeared in greater quantities in the streams usually frequented than during the brood year, or for many years past. These streams are the Oyster, Tsolum, and Tsable rivers, and Cook and Nile creeks.

*Chums*.—Although very late in commencing, the run of chums was considered much better than in any of the past four years. The numbers reaching the spawning grounds were far greater than during the brood year, intervening years, and for several years previous to the brood year.

*Steelheads*.—The number appearing in the various streams can be said to be equal to the usual run. The inspector is of the opinion that the favourable increase in the return of parent salmon to the streams of his district is due to provision of the two-mile limit on most of the spawning streams and total closure of Baynes sound to salmon net fishing. Establishment of the rectangular boundary at the two Qualicum rivers, during the period in which fishing is allowed to within half a mile, has given added protection to those streams. The percentage of escapement was noticeably larger.

*Pender Harbour Subdistrict*

*Sockeye*.—A satisfactory run occurred in the Saginaw area, and the escapement reaching the spawning grounds was fully equal to that of the brood year. Catches each year continue to be consistently good, and it is quite evident that the sockeye supply is being well maintained. The average light run occurred at Narrows arm, but, as usual, was not fished.

*Cohoes*.—A good average run appeared in all sections of the subdistrict, and all streams received parent salmon in quantities fully equal to the brood year.

*Pinks*.—As usual pink salmon appeared in large numbers in the streams of the upper reaches of Jervis inlet. A good run occurs here every year, and the run of the current year was fully equal to those of all recent years. The

run to Vancouver bay is reported by the inspector to have shown a slight decrease as compared with the brood year. All other streams of the district received pinks in quantity about equal to the brood year.

*Chums.*—Chums entered all the streams of the district in larger numbers than last year, and were at least equally as plentiful as during the brood year. The inspector and his patrolmen report some of the streams as heavier seeded than during the brood year. Extension of fishery boundaries off the mouths of many of these streams some years ago has had the effect of allowing for a greater escapement.

*Steelheads.*—These continue to appear each year in the usual average quantities in all streams frequented by them.

#### *Nanaimo Subdistrict*

More coho and chum salmon, and steelheads have been observed on the spawning grounds during the past three years than during many years previous to that period. Spawning conditions this year are far more satisfactory than during the brood year, in each instance.

#### *Ladysmith Subdistrict*

For purposes of this report Nanaimo river is included with the Ladysmith district, as patrol of that stream has been undertaken to some extent by the inspector for the Ladysmith subdistrict but also by other officers when available.

*Cohoes.*—These salmon appeared in satisfactory quantities, and all streams of the subdistrict frequented by them had good average runs, which were considered at least equal to those of the brood year.

*Springs.*—Spring salmon reaching the Nanaimo river have seemed to be on the increase during the past few years, and the run to Chemainus river compared very favourably with the runs of all recent years.

*Pinks.*—These do not run here in quantity, but the numbers appearing in the few streams frequented by them were this year about equal to the light runs of two years ago.

*Chums.*—Chums appeared in large quantities in Nanaimo and Chemainus rivers, and in all the smaller streams. These runs can be said to have been considerably heavier than those of the brood year.

*Steelheads.*—The usual small numbers were in all streams frequented by these fish, and it is quite evident that the numbers were equally as good as in recent years, if not slightly better.

#### *Cowichan Subdistrict*

*Springs.*—Springs appeared in very satisfactory numbers in the Cowichan river. The inspector reports that the number ascending the river was considered greater than during the brood year, and that the usual light run occurred in the Koksilah river.

*Cohoes.*—The coho run, while considered light in the Cowichan river, was estimated to be equal to that of the brood year. In Koksilah river there was a good early run of cohoes, but the late run is reported as lighter than the brood year.

*Chums.*—The run has apparently been lighter than during the past two years in the Cowichan river, but it compares quite favourably with that of the brood year. Chum salmon were still entering the river in quantities at the time of inspection.



*Steelheads.*—The run in the early part of the year in both Cowichan river and Koksilah river was considered heavy. Owing to high water it was difficult to determine the extent of the late run which was just commencing at time of inspection.

#### *Victoria Subdistrict*

*Cohoes.*—The number of parent coho on the spawning beds of the various streams in the Victoria district is quite similar to previous years. At Demanuel creek, in the Sooke district, conditions are more favourable than usual, and more cohoes reached the upper stretches of the river than in previous years, due chiefly to removal of the large log obstruction which has caused so much difficulty in recent years.

*Chums.*—A good average run appeared in Goldstream, Sooke river, and all other streams of the Victoria district.

*Steelheads.*—These fish were seen in about the usual average quantity in the few streams frequented by them.

#### *Barclay Sound Subdistrict*

*Sockeye.*—The run of sockeye to Somass river was considered much heavier than the brood year, and very satisfactory numbers ascended to the spawning areas of Great Central and Sproat lakes. The Anderson river run was again disappointing, the estimated numbers reaching the spawning grounds being much lighter than in the brood year. The run to Nitinat arm was equally as good as that of the brood year, and there was a satisfactory escapement to the spawning grounds of Hobarton lake, which is the sockeye spawning area of Nitinat.

*Cohoes.*—Cohoes appeared in the streams of Barclay Sound district in larger numbers than for several years, and it is quite safe to say that the streams were equally as well seeded as in the brood year. The inspector reports just one exception, Anderson river, where the run was light.

*Springs.*—Very good runs occurred in all of the large streams of the district, with the exception of Anderson river. These fish appeared on the spawning grounds in numbers equal to any of the runs of many years past.

*Chums.*—All the streams of the district were well seeded by this variety, with the exception of Sarita and Toquart rivers, and the small stream at Dutch harbour. Owing to extreme low water conditions and poor escapement of chums to the Barclay Sound streams it was necessary to place special closure on all net fishing in Barclay sound, exclusive of Alberni canal, from October 20th to 28th. Special protection was given the chum runs to the three streams mentioned above by shifting out boundaries and providing large closed areas off the mouths. Spawning conditions were excellent in Nitinat area, and all streams throughout the whole of the district were at least as well seeded as during the brood year.

*Pinks.*—These salmon do not run in appreciable quantities in the district, and practically none was seen this year.

*Steelheads.*—The usual good runs appeared in the Somass River watershed, at Nahmint, and other large streams of the district.

#### *Clayoquot Sound Subdistrict*

*Sockeye.*—There was an excellent run to the Kennedy Lake watershed and a good average run to Megin lake. The inspector reports an increase of parent sockeye on the spawning beds of Kennedy Lake area over the brood year, and the run to Megin lake about equal to that of the brood year.



*Coho*.—Marked increase in the number of cohoes in all the streams was noticeable, in comparison with the brood year.

*Springs*.—This year's run to the main streams of the district is reported by the inspector as the heaviest he has seen for many years, and the streams frequented by them are well seeded.

*Chums*.—A very good run occurred and each stream received parent chums in quantities fully equal to the brood year.

*Pinks*.—Pink salmon do not run in large quantities in this subdistrict. The numbers appearing this year were about equal to those of two years ago.

*Steelheads*.—These were in the streams in apparently the usual quantities.

#### *Nootka Sound Subdistrict*

*Sockeye*.—The run to Gold river and the several smaller streams frequented by sockeye was just about the usual average. The inspector states there is never much fluctuation in these runs from year to year.

*Coho*es.—The usual light run occurred again this year, and the quantities reaching the spawning grounds can be said to have been fully equal to the brood year.

*Springs*.—A good run occurred at Burman river, but the runs to other streams of the district were lighter than the past year. The inspector states that the numbers of springs in the streams throughout the district would average as well as previous runs of light years.

*Chums*.—The numbers reaching the spawning grounds were definitely heavier than during the brood year. Owing to dry weather and low water conditions in the streams it was necessary to enforce special closed periods, but after the advent of heavy rains chums appeared on the spawning grounds of all the streams in large numbers. The whole area was then opened again to fishing, and operations continued until the seiners ceased fishing.

*Pinks*.—Pinks do not run in quantity in this subdistrict. The usual very small numbers appeared in the few streams frequented by this species.

*Steelheads*.—The usual numbers returned to the different streams of the district.

#### *Kyuquot Sound Subdistrict*

*Sockeye*.—Light runs of creek sockeye appeared in the few streams usually frequented. The runs were of about the same proportions as those of the brood year.

*Coho*es.—The run appearing in the streams was considerably lighter than the brood year.

*Springs*.—A very satisfactory run appeared in the main streams of the district. The inspector reports that the numbers in the streams compares very favourably with the runs of last year, and those of previous years.

*Chums*.—The numbers on the spawning grounds throughout the district were much smaller in comparison with those of the brood year. The run was of short duration, and as heavy freshets coincided with the main run it was impossible to determine the extent of the escapement. This area will require to be given special attention four years hence.

*Steelheads*.—Are reported in the Kyuquot district streams in their usual small numbers.

*Pinks.*—The pink run is not commercially important here. The inspector reports a forty per cent decrease from that of the brood year.  
*Quatsino Subdistrict*

*Sockeye.*—The light runs to the district do not fluctuate greatly. The numbers appearing this year equalled about the usual average.

*Cohoe.*—A satisfactory increase over the brood year was noticeable in the stream of Rupert Arm area. In other parts of the district cohoes ascended the streams in quantities equal to the brood year, except at Brooks bay where the run was reported as lighter.

*Springs.*—A heavy run occurred at Marble creek where conditions were very favourable, and spawning was equally as good as for several years previous.

*Chums.*—There was a good average spawning in all streams throughout the district. The seeding was fully as heavy as during the brood year.

*Pinks.*—Throughout the whole of the Quatsino Sound area a heavy increase of pinks was noticeable, as compared with the showing for the two previous brood years. All streams frequented by this variety were heavily seeded. In the outside portion of the area the runs appearing were about equal to those of previous cycle years.

*Steelheads.*—In Marble creek steelheads appeared in large numbers, and the other streams of the district received average runs.

## APPENDIX No. 2

### SUMMARY REPORT OF THE WORK OF THE BIOLOGICAL BOARD OF CANADA FOR THE YEAR 1934

BY THE CHAIRMAN, DOCTOR A. T. CAMERON, WINNIPEG

In the first report of the board which it is my privilege to present I desire to bear testimony to the service my predecessors have given to the fishing interests of this Dominion. Dr. E. E. Prince, long time Commissioner of Fisheries, helped to found the first Marine Biological Station in 1898 and acted as its director, and subsequently, when the board was established by Act of Parliament in 1912, he became its first Chairman. During the chairmanship of Professor Knight of Queen's University (1921-26) the board commenced to increase in size and to show a more definite trend towards practical aims; two representatives of the fishing industry were for the first time appointed to it, while the two Fisheries Experimental Stations were established.

My immediate predecessor, Dr. J. Playfair McMurrich, was first appointed to the board in 1912, when it consisted only of nine members, and looked after only two stations, at which the work was largely biological in the narrower sense, and was done almost entirely by voluntary workers. He became chairman in 1926 and retired from the chairmanship on January 3, 1934, the board then comprising eighteen members, controlling four stations and several sub-stations, and employing a large number of full-time scientists engaged in work of biological, chemical, bacteriological, and engineering nature, all directed specifically towards the solutions of problems of the fishing industry. Much of the great change in extent and scope of the board's work has taken place during his chairmanship, and has taken place smoothly and efficiently largely because of the wise guidance of himself and of Mr. J. J. Cowie, Secretary-Treasurer of the board, aided by the skill and co-operation of Dr. A. G. Huntsman, the most senior of our directors.

I wish to outline briefly the general scope of the board's work and some of its difficulties, and to mention some of its successes and our hopes for future successes.

The board started largely as a group of voluntary workers, utilizing a small grant of public money for the investigation of research problems, some of which were of obvious practical importance, and of some of which the importance was perhaps neither so practical nor so obvious. It has become an executive body, controlling as wisely as it can a larger sum of public money, which is expended in paying the upkeep of a number of experimental laboratories, and field stations, the salaries of a large number of full-time scientists and of the necessary adjunct non-scientific staff, and in publishing the reports of results obtained. The whole object of the work of our full-time staff is the solution of the practical problems of the Fishing Industry and other fisheries' interests.

A very small proportion of the board's funds—last year between one and two per cent—is used to pay expenses of volunteer workers during the summer, but it is to be noted that the policy of the board demands that almost all their work shall also be on problems designed to assist the fishing interests—marine and fresh-water.

The members of the board itself are engaged in many and varied activities. The majority hold university positions, in zoology, or botany, or histology, or chemistry, or biochemistry, while in addition the Department of Fisheries has its own representatives, and the Fishing Industry is also directly represented. The board is therefore able to assist technically in giving constructive criticism



to the varied biological, chemical, biochemical, bacteriological and even engineering problems (for whenever laboratory results have to be applied to an industry an engineering problem is involved) that have to be solved by the board's scientists if the industry is to be properly assisted.

The following is the list of stations and sub-stations at present operated by the board:—

#### *Atlantic Coast*

St. Andrews, N.B. Atlantic Biological Station.

Field work on sea-fishery and fish-cultural problems is carried out at many points in New Brunswick and Nova Scotia, and is controlled from this station.

Ellerslie, P.E.I. Biological Sub-station.

Associated with the St. Andrews Station, and concerned especially with oyster culture.

Halifax, N.S. Atlantic Fisheries Experimental Station.

Concerned with the handling and preservation of fish for food and the development of fish products other than food. (With this station is associated the Eastern Passage Laboratory.)

#### *Pacific Coast*

Departure Bay, B.C. Pacific Biological Station.

Field work directed from this station is carried out at numerous places in British Columbia and the adjacent waters.

Cultus Lake, B.C. Biological Sub-station.

Under direction of the Departure Bay Station, and immediately concerned with study of the propagation of sockeye salmon.

McClinton Creek, Queen Charlotte Is., B.C. Biological Sub-station.

Under direction of the Departure Bay Station, and immediately concerned with study of the propagation of "pink" salmon.

Prince Rupert, B.C. Pacific Fisheries Experimental Station.

Concerned with the handling and preservation of fish for food and the development of fish-products other than food.

It should perhaps be stressed that in many respects these stations should be considered as constituted by the group of scientists connected with them, rather than by a group of buildings. Some problems can be brought to the buildings for study, but the majority also require an attack in the field. When such attack needs prolonged work a sub-station is established.

While the problems of the east and west are frequently interlocked, so that solution of the one often aids solution of the other, the division of the work and the workers is approximately equal, as between east and west. This is clearly shown by the following figures (which include only actual expenditures in east and west, and not cost of publications and other general expenses).

Year	Atlantic Coast	Pacific Coast
1930-31.....	\$ 202,748 14	\$ 156,662 99
1931-32.....	119,748 42	137,477 49
1932-33.....	103,793 19	107,818 42
1933-34.....	83,379 13	83,520 23
1934-35 (allotted).....	79,671 00	77,082 00
Total 1930-35.....	\$ 589,339 88	\$ 562,561 13

The two Fisheries Experimental Stations are concerned with closely related problems, and maintain the closest co-operation; there is no waste from overlapping. An excellent example of the co-operation is shown in their studies of refrigeration problems, to which I shall refer later.

It is perhaps desirable to stress the truth that while the whole of the board's activities are concerned with research of a practical nature, yet success in any research, whether that is ideally practical or concerned with such impracticabilities as the determination of the number of the stars in the Milky Way, depends on certain fixed principles.

Success is more probable of achievement, the greater the amount of money available. For the more money we have, the larger the number of scientists who can be employed on any particular problem, and the more concentrated the attack that can be made on it. In war the massed attack gives best results. Research is war on the unknown.

But success in research is not entirely a matter of dollars and cents. There is an intangible element, of luck perhaps, or lack of it, which may bring success rapidly for certain problems, and defer it indefinitely for others. The board cannot guarantee, therefore, that it will be successful in solving any particular problem. It can only do its best with the funds placed at its disposal; the larger the amount of such funds, the greater is the probability of rapid success.

During the past few years our yearly grant has decreased greatly, but the number of problems we have been asked to try to solve (by the department and by the industry) has by no means decreased. It is therefore of importance to point out that, since we have only a limited staff, engaged on many problems, it is impossible to commence new work unless men are transferred from other work, which is perhaps nearly completed and of at least equal importance. There must either be delay with the new, or waste with the old. A little delay seems better.

It is even possible that in the past our energies have been too greatly scattered, and our present policy is to concentrate our available staff on the most important of the problems laid before us.

May I be allowed to refer to the very close co-operation between the Board and the department. Two members of the department are members of the board. The deputy minister is keenly interested in and is closely informed of the board's work. He continually consults its officers and is consulted by them, and I believe it is permissible to say that he has full confidence in us. The board is in practice the Scientific Division of the department, and red tape is reduced to a minimum to enable our scientists to assist the officers of the department in every way possible.

Closer contact has been established with the National Research Council for the purpose of mutual assistance and to prevent over-lapping, and I desire to acknowledge the ready co-operation of Dr. Tory in bringing about this rapprochement.

During the past year certain changes in the directorships have been made, which we believe will prove beneficial to the board's work. Dr. A. G. Huntsman is now especially in charge of the board's publications, is personally engaged in economic research of importance to the Atlantic fisheries, and is constantly available to the executive in a consultative capacity. Dr. A. H. Leim has been transferred from Halifax to the St. Andrews Station, and Dr. D. B. Finn from Prince Rupert to Halifax. Dr. N. M. Carter, Associate Chemist at the Departure Bay Station, has been made Director at Prince Rupert.

There is a demand for the establishment of a sub-station in the province of Quebec, possibly at Gaspé, but no action can be taken until the Government sees its way clear to provide funds for such an establishment. Hopeful that such provision may be made in the future we have appointed a French-Canadian scientist temporarily to the Halifax Station, for special training in the holding of fishermen's courses and allied work carried on at that station.

Last August the North American Council on Fishery Investigations held a meeting at Halifax on board the French Research ship *Président Théodore Tissier*. The board was represented by Dr. McMurrich, Mr. Whitman,



Professor Bean, Dr. Huntsman, and others, and the discussions of the meeting will prove of great value in many aspects of the future work of the board on the Atlantic coast.

On account of the far-flung work of the board and the difficulties of frequent meetings, even of its scattered Executive, it has become the duty of the chairman and the secretary to visit at least once a year the four Stations, and some of the sub-stations as well, so that they may be able to advise the executive with first-hand information.

May I now refer briefly to some of the problems that the board has solved, and to some that it believes that it is in process of solving. Some of these are major and some are minor problems. Differentiation is difficult. A minor problem may be very important to a small community.

*Refrigeration.*—By experimental work carried out at Halifax and at St. Andrews the board has demonstrated the possibility of producing and marketing rapidly frozen fish, which are equal in quality to fresh fish, and the Industry is now in possession of the necessary information.

The correct conditions for the freezing and cold storage of fish have been determined and made available to the Industry (researches at the Halifax and Prince Rupert Stations), and an investigation on an improved type of railway refrigeration car for transport of fresh fish is nearing completion (Prince Rupert).

A smaller problem, successfully solved, has been the design of a cheap and practical bait freezer (at the Halifax Station). One such freezer has been placed in operation. Numerous applications have been made for others of the same type.

*Fish Oils.*—As a result of researches carried out at the Prince Rupert Station over a number of years the following practical uses of fish oils have been demonstrated. (i) The successful use of pilchard oil in the paint industry for the manufacture of paints and varnishes. (ii) The production of odourless and tasteless cooking fats and of soaps from pilchard oil by chemical transformations. (iii) The production of medical preparations rich in vitamins A and D from mixtures of pilchard and other suitable fish oils.

*Smoking of Fish.*—An investigation was commenced at the Halifax Station as early as 1925. The early results were utilized by the industry in Eastern Canada with considerable benefit, and led, incidentally, to the study of similar problems in Great Britain.

Intensive work on this problem was recommenced at Halifax in 1930. The results have already enabled the Industry to overcome the vicissitudes of weather conditions during the processing. Further work is in progress.

*Discolouration of Halibut.*—An investigation carried on from the Prince Rupert Station traced the discolouration of halibut to bacterial infection of the fish during its transport from the fishing grounds to port. A successful method has been devised for overcoming this discolouration, with consequent increase in value of the fish when landed.

This work has led to a general study of disinfection and cleanliness in the fishing vessels. As a result, at the present time 50 per cent of the fish landed at Prince Rupert are from vessels treated by the disinfecting process developed at the Station, and this method has also been applied to vessels at Vancouver and on the Atlantic coast.

*Fish Culture.*—For many years the board's scientists have assisted the Fish Cultural Branch of the department in solving its problems, and the success of their work has been largely increased through the fact that the Director of the Fish Culture branch is a member of the board.



*Trout.*—Dr. Knight and Mr. White a number of years ago demonstrated that a heavy mortality of trout fry occurred in streams in Eastern Canada, and established the principles which should be followed to combat this mortality.

Dr. Mottley of the Pacific Biological Station has investigated trout problems in many British Columbian lakes and streams, and the results of his investigations are leading to the successful management of the game fish resources of that Province, through controlled equilibrium between production, out-take, and food-supply.

*Oyster Culture.*—Dr. Needler has developed the scientific basis for successful oyster culture in eastern Canadian waters (especially in Malpeque Bay, P.E.I.), and through the establishment of this scientific basis has successfully carried out for the department plans for oyster farming through the leasing of oyster areas.

Following the researches of Dr. Elsey (of the Pacific Biological Station) the original oyster-producing beds in British Columbia have greatly increased their stocks, new areas have been developed, and the canning of oysters has been established as a successful commercial project.

*Cod and Haddock.*—Members of the staff of the St. Andrews Station have made an intensive study of the cod and haddock migration in Atlantic waters adjacent to Nova Scotia, which has shown that this migration is closely associated with complicated temperature conditions in these waters. These studies are therefore being pursued still more intensively, in the hope that a basis of control may be found which will enable particular fishing grounds to be fished more successfully and with greater certainty of results.

*Tagging.*—The tagging of Pacific salmon has disclosed some of the main migration routes and provided valuable information which may be used in the regulation of the fishery. The decrease in our funds has caused a temporary cessation of this work. We hope to be able to continue it when funds permit.

*Sinking of gill nets.*—An investigation into the cause of the sinking of gill nets near the mouth of the Naas river, B.C., carried out in the summer of 1931, is an excellent illustration of successful attack on a problem, which, though only of local significance, was yet, locally, of considerable importance. The sinking of these nets had caused serious loss to fishermen and cannery operators during the preceding two years, and was blamed upon the effluent of the Anyox smelter. Microscopic examination of the silt from the river and the deposits on the nets showed them to be identical, and to be quite different from the material discharged from the smelter, which was therefore guiltless. The precise cause of the loss of nets was traced to unusually high tides leading to rapid mixture of river-water laden with silt and sea-water rich in living marine organisms such as jelly-fish. The latter were killed by the fresh water, adhered to the nets, and collected the silt until the nets sank through the added weight.

*Educational work.*—Practical courses of instruction to fishermen were commenced at the Halifax Station in 1928, and have since been given annually. Periodic instruction has also been given at Halifax to fishery officers (to qualify them for the position of Inspector of Fisheries), to hatchery officers, and to cannery managers. Certain members of the staff at St. Andrews have also assisted in this work. The educational program has resulted in a heightened interest and an increasing demand for the educational services of the station, from both fishermen and others.

Similar courses for fishery officers and hatchery officers have been given at the Pacific coast by the staff of the Departure Bay Station.

Lectures have been given from time to time to the fishermen at Prince Rupert, stressing the importance of cleanliness and proper handling of fish.

Plans are being made to give similar series of lectures to fishermen in the southern part of the Province.

Two instances of less-direct educational work may be mentioned.

Fishmeal in the Maritime Provinces lacked a suitable market. An educational campaign directed from the Halifax Station to the farmers and the industry, dealing with correct methods of production and of utilization, has led to the total absorption of the whole output within the Maritime Provinces themselves.

Some research has been carried out at Prince Rupert on desirable modifications of the holds of fishing vessels. A model hold has recently been exhibited and discussed at a well-attended meeting of both staff and fishermen, with such educational advantage to both that plans are being made for the adoption of such a model (still further improved) on the large scale.

These brief notes give a slight account of some of the very diverse activities of the board's staff over a period of years.

During the past summer Dr. A. G. Huntsman has been personally engaged in a preliminary study of the Margaree river system, with the object of determining how a sufficient supply of salmon can be assured for the angling in that river. He also commenced comparative studies of the conditions governing movements of salmon in the Saint John river system and in Minas channel, which contrast sharply with those in the Margaree system. These studies are designed to throw light on the factors governing the return of salmon to these rivers. Further studies have been made of the complicated water movements in the Passamaquoddy region which affect the local distribution of herring and its food.

# APPENDIX No. 2

## FISH CULTURE

### ANNUAL REPORT BY J. A. RODD, DIRECTOR

The fish cultural operations of the Department of Fisheries are confined to those provinces in which it administers the fisheries in whole or in part, viz., Nova Scotia, New Brunswick, Prince Edward Island and British Columbia. The hatcheries located in the National Parks in Alberta are also directed by the Department of Fisheries but at the expense of the National Parks branch, Department of the Interior.

The total distribution from the hatcheries operated by this department in 1934 was 89,261,999. The numbers of each species which were distributed were:—

STATEMENT BY SPECIES, OF THE FISH AND FISH EGGS DISTRIBUTED FROM THE HATCHERIES DURING THE YEAR ENDED DECEMBER 31, 1934

Species	Green eggs	Eyed eggs	Fry	Advanced fry	Fingerlings	Yearlings and Older	Total distribution
<i>Salmo salar</i> —Atlantic salmon.....	36,076	1,300	1,555,739	1,151,582	10,384,061	435	13,129,193
<i>Salmo salar sebago</i> —Landlocked salmon.....	6,000				80,049		86,049
<i>Salmo irideus</i> —Rainbow trout.....			363,069	270,500	1,122,957	62,601	1,819,127
<i>Salmo clarkii</i> —Cutthroat trout.....			412,986	180,000	1,343,804	125	1,938,915
<i>Salmo gairdneri</i> —Steelhead salmon.....		2,828	109,880		122,903		235,611
<i>Salmo gairdneri kamloops</i> —Kamloops trout.....	100,000	4,212,988	2,485,828		790		6,799,606
<i>Salmo leucomaenis</i> —Loch Leven trout.....		200		254,975	13,647	4	268,826
<i>Salmo fario</i> —Brown trout.....			170,000	100,000	376,017		646,017
<i>Salmo fario</i> —Hybrid brown trout (Brown trout—Atlantic salmon).....						71	71
<i>Salmo fario</i> —Albino brown trout.....						6	6
<i>Oncorhynchus nerka</i> —Sockeye salmon.....	231,940	16,547,706	31,576,745	1,494,549	2,951,863		52,802,803
<i>Oncorhynchus tshawytscha</i> —Spring salmon.....		524,265	798,060		299,062		1,621,387
<i>Oncorhynchus kennerlyi</i> —Kennerly's salmon.....		200,000	637,498				837,498
<i>Oncorhynchus kisutch</i> —Coho Salmon.....		525,000	454,960				979,960
<i>Salvelinus fontinalis</i> —Speckled trout.....	32,200	80,500	583,746	1,752,455	5,465,433	90,942	8,005,276
<i>Cristivomer namaycush</i> —Salmon trout.....				93,190	464		93,654
	406,216	22,094,787	39,148,511	5,297,251	22,161,050	154,184	89,261,999

In addition to the above 255,000 cutthroat trout eyed eggs were purchased from the Cranbrook Rod and Gun Club, and planted direct as follows:—

Davis lake.....	30,000
Fording river (Natal district).....	50,000
Goat river (Creston district).....	50,000
Hatzic lake.....	35,000
Nicomel river.....	30,000
Serpentine river.....	30,000
Salmon river.....	30,000
	255,000

Inspections were continued with a view to locating waters where fish eggs might be obtained in sufficient quantities to warrant the establishing of collecting camps and also with a view to locating sites where the Fish Culture Service might be extended advantageously to districts that are not readily accessible from existing hatcheries.

Experiments with equipment, methods and foods of various kinds were continued at several hatcheries. The experiments and the investigations in relation to fish cultural problems that were made by the Biological Board of Canada are referred to in Appendix No. 2 of the Report of the Department of Fisheries for 1934-35.



The Fish Cultural Branch participated with units showing hatchery products and equipment in exhibits that were made at Yarmouth, Nova Scotia, Saint John, Saint Stephen and Fredericton, New Brunswick.

Some 15,755 suckers, approximately 9.8 tons in weight were destroyed in thoroughfare between First and Second lakes, Loch Lomond and in Wilmot stream, which flows into Loch Lomond near Saint John, New Brunswick. Some 12,215 coarse fish (squawfish, suckers, carp, etc.) were also destroyed in Blue lake (Princeton area), Boyce's slough (Kelowna district), Okanagan control dam and lake, and Duck lake (Kelowna district), in British Columbia.

Twenty-four main hatcheries, eleven subsidiary hatcheries, nine salmon retaining ponds and several egg-collecting stations were operated in 1934. The output from these establishments was as follows:—

THE FOLLOWING TABLE SHOWS THE HATCHERIES OPERATED, THEIR LOCATION, DATE OF ESTABLISHMENT, THE SPECIES AND THE NUMBER OF EACH SPECIES DISTRIBUTED FROM EACH HATCHERY DURING 1934

Estab- lished	Hatchery	Location	Species	Green eggs	Eyed eggs	Fry	Advanced fry	Finger- lings	Year- lings and older	Total distrib- ution by species	Total distrib- ution by hatcheries
1929	Antigonish.....	Fraser's Mills, N.S.....	Atlantic salmon.....	.....	.....	.....	100,000	1,388,228	.....	1,388,228	.....
			Rainbow trout.....	.....	.....	.....	.....	92,198	114	92,312	.....
1876	Bedford.....	Bedford, N.S.....	Speckled trout.....	.....	.....	.....	.....	1,461,770	12,204	1,473,974	2,954,514
			Atlantic salmon.....	(e) 5,500	300	.....	.....	997,580	.....	1,003,380	.....
			Landlocked salmon.....	.....	.....	.....	.....	40,000	.....	40,000	.....
1912	Lindloff (a).....	St. Peters, N.S.....	Loch Leven trout.....	.....	200	.....	254,975	845,735	.....	255,175	.....
			Speckled trout.....	.....	500	300	.....	252,125	.....	846,535	2,145,090
			Atlantic salmon.....	.....	.....	.....	182,832	124,519	.....	434,957	.....
			Rainbow trout.....	.....	.....	.....	.....	63,129	.....	124,519	.....
1902	Margaree.....	N. E. Margaree, N.S.....	Speckled trout.....	.....	.....	.....	224,000	1,681,258	.....	63,129	622,605
1913	Middleton.....	Middleton, Annapolis Co., N.S.....	Atlantic salmon.....	.....	.....	.....	.....	108,796	720	109,516	1,914,774
1933	Nictaux Falls (d).....	Nictaux Falls, N.S.....	Speckled trout.....	.....	.....	.....	.....	976,700	.....	976,700	.....
			Atlantic salmon.....	.....	.....	.....	.....	731,000	296	731,296	1,707,996
1929	Yarmouth.....	South Ohio, N.S.....	Speckled trout.....	.....	.....	.....	.....	61,000	.....	61,000	67,100
			Atlantic salmon.....	.....	.....	.....	.....	498,878	435	499,313	.....
1925	Chamcook lakes (b).....	Charlotte Co., N.B.....	Speckled trout.....	.....	.....	.....	.....	108,500	62,174	170,674	.....
1928	Florenceville.....	Florenceville, N.B.....	Landlocked salmon.....	(e) 6,000	.....	.....	.....	553,800	75,602	629,402	1,290,389
1880	Grand Falls.....	Grand Falls, N.B.....	Speckled trout.....	.....	.....	.....	.....	1,048,000	.....	1,108,000	.....
			Atlantic salmon.....	.....	.....	.....	60,000	514,537	.....	904,537	2,012,537
1915	Tobique (a).....	Plaster Rock, N.B.....	Speckled trout.....	.....	228,958	.....	390,000	1,182,135	.....	1,182,135	.....
1874	Miramichi.....	South Esk, N.B.....	Atlantic salmon.....	.....	185,000	.....	750,000	148,413	.....	1,127,371	2,309,506
			Speckled trout.....	.....	.....	.....	.....	80,000	.....	185,000	185,000
1874	Restigouche.....	Flatlands, N.B.....	Atlantic salmon.....	.....	.....	.....	74,000	1,547,859	.....	1,627,859	1,775,661
			Speckled trout.....	.....	.....	.....	250	98,472	.....	147,802	.....
1914	Nipisiguit (a).....	Bathurst Mines, N.B.....	Atlantic salmon.....	.....	.....	.....	.....	139,047	.....	139,047	1,236,681
1914	St. John.....	Saint John, N.B.....	Speckled trout.....	.....	.....	371,827	.....	.....	.....	371,827	371,827
			Atlantic salmon.....	.....	1,000	.....	210,000	151,600	6	362,600	.....
			Brown trout, hybrids.....	.....	.....	.....	.....	.....	71	71	.....
			Landlocked salmon.....	.....	.....	.....	.....	40,049	.....	40,049	.....
			Loch Leven trout.....	.....	.....	.....	.....	.....	4	4	.....
1914	St. John Salmon Pond.....	Saint John, N.B.....	Speckled trout.....	(e) 32,200	.....	.....	.....	443,635	278	517,943	920,951
1906	Kelly's Pond.....	Southport, P.E.I.....	Atlantic salmon.....	(e) 30,576	.....	40,000	.....	.....	2,108	30,576	30,576
			Speckled trout.....	.....	.....	.....	294,500	680,835	.....	975,335	.....
1914	Banff.....	Banff, Alberta.....	Brown trout.....	.....	.....	.....	100,000	489,818	.....	662,818	1,638,153
			Cutthroat trout.....	.....	.....	.....	.....	373,200	.....	473,200	.....
			Kamloops trout.....	.....	94,690	.....	.....	1,120,425	.....	1,120,425	.....
			Rainbow trout.....	.....	.....	.....	10,000	530,340	.....	540,340	.....
			Salmon trout.....	.....	.....	.....	365,455	93,190	.....	93,654	.....
			Speckled trout.....	.....	.....	.....	.....	24,898	12	390,365	2,712,674





## HATCHERY OUTPUT, BY PROVINCES, OF EGGS, FRY, FINGERLINGS, YEARLINGS AND OLDER FISH DURING 1934

—	Green eggs	Eyed eggs	Fry	Advanced fry	Finger- lings	Year- lings and older	Total distrib- ution by species	Total distrib- ution by province
Nova Scotia—								
Atlantic salmon.....	5,500	300		506,832	5,655,769	435	6,168,836	
Landlocked salmon..					40,000		40,000	
Loch Leven trout....		200		254,975			255,175	
Rainbow trout.....					325,217	62,288	387,505	
Speckled trout.....		500	300		3,770,330	88,822	3,859,952	
	5,500	1,000	300	761,807	9,791,316	151,545	10,711,468	10,711,468
New Brunswick—								
Atlantic salmon.....	30,576	1,000	1,555,739	350,250	4,028,066		5,965,631	
Brown trout, albinos						6	6	
Brown trout, hyb- rids (Brown trout —Atlantic salmon)						71	71	
Landlocked salmon..	6,000				40,049		46,049	
Loch Leven trout....						4	4	
Rainbow trout.....						278	278	
Speckled trout.....	32,200		408,005	1,214,000	1,180,387	2,108	2,836,700	
	68,776	1,000	1,963,744	1,564,250	5,248,502	2,467	8,848,739	8,848,739
Prince Edward Island—								
Atlantic salmon.....				294,500	680,835		975,335	
Speckled trout.....				173,000	489,818		662,818	
				467,500	1,170,653		1,638,153	1,638,153
Alberta—								
Brown trout.....				100,000	373,200		473,200	
Cutthroat trout.....			178,600	180,000	1,332,055	125	1,690,780	
Kamloops trout.....		94,690	95,646				190,336	
Rainbow trout.....			363,069	270,500	797,740	35	1,431,344	
Salmon trout.....				93,190	464		93,654	
Speckled trout.....				365,455	24,898	12	390,365	
		94,690	637,315	1,009,145	2,528,357	172	4,269,679	4,269,679
British Columbia—								
Atlantic salmon.....					19,391		19,391	
Brown trout.....			170,000		2,817		172,817	
Coho salmon.....		525,000	454,960				979,960	
Cutthroat trout.....			234,336		11,749		246,135	
Kamloops trout.....	100,000	4,118,298	2,390,182		790		6,609,270	
Kennerly's salmon..		200,000	637,498				837,498	
Loch Leven trout....					13,647		13,647	
Sockeye salmon.....	231,940	16,547,706	31,576,745	1,494,549	2,951,863		52,802,803	
Speckled trout.....		80,000	175,441				255,441	
Spring salmon.....		524,265	798,060		299,062		1,621,387	
Steelhead salmon....		2,828	109,880		122,903		235,611	
	331,940	21,998,097	36,547,152	1,494,549	3,422,222		63,793,960	63,793,960
								89,261,999

In addition to the above 255,000 cutthroat trout eyed eggs were planted direct in British Columbia waters as detailed in previous statement.

The experimental introduction of brown trout into the Cowichan and Little Qualicum rivers, British Columbia, was continued. A fourth allotment of 200,000 eggs for this experiment was received on December 1, 1934, from The Rainbow Ranch, Troy, Montana, U.S.A. Several specimens of these fish of legal size, and some males in a spawning conditions were caught during 1934.

The Canadian National Railway, Canadian Pacific Railway, Esquimalt and Nanaimo Railway and the Dominion Atlantic Railway Companies continued

their generous assistance and co-operation by furnishing free transportation for shipments of game fish and game fish eggs with their attendants. The extent of this co-operation is indicated in the following summary:—

Railways	Total mileage on trip passes	Number of passages	Mileage baggage car permits			Number of cases or cans			Number of permits
			Full	Empty	Total	Full	Empty	Total	
C.N.R.....	3,125	24	3,337	3,198	6,535	112	107	219	41
C.P.R.....	10,838	55	8,310	8,092	16,402	352	335	687	100
E. & N.R.....	840	16	453	413	866	57	61	118	18
D.A.R.....	103	1	103	103	206	8	8	16	2
	14,906	96	12,203	11,806	24,009	529	511	1,040	161

NOTE:—Number of passages refers to transportation one way. A return trip counts as two passages. Number of permits refers to one way passage for cases or cans.

The general public is showing an increasingly greater interest in the fish cultural operations of this department, and gratifying reports regarding results that are apparent from the distribution of hatchery output continue to accumulate from all districts where this department is operating hatcheries.

The interest shown in fish cultural work and the assistance and co-operation tendered by private individuals and local organizations such as fish and game clubs, angling and protective associations, boards of trade, service clubs, etc., was continued to an increased degree during the past year. Several rearing ponds, some of them on a rather extensive scale, were constructed and operated by groups of sportsmen. Rearing ponds of this nature were operated for the first time as follows:—

Tusket river natural pond, Digby county, N. S.

New Brunswick Fish and Game Protection Association.

Fredericton rearing pond No. 1.

Fredericton rearing pond No. 2.

St. Andrews rearing pond.

St. Stephen rearing pond.

Kelowna Rod and Gun Club rearing ponds, Kelowna, B. C.

Vernon Angling Club rearing pond, Vernon, B. C.

This department furnished biological, fish cultural and engineering advice when requested in all instances prior to development, and it has also supplied eggs or fry up to the capacity of the respective ponds. The Avon River Power Company has continued its cordial and valuable assistance and co-operation in connection with the Nictaux salmon retaining pond and trout rearing tanks.

Officials and employees of other dominion departments, provincial officials, officers and crews of fishery patrol and protection boats, and other branches of this department have cordially co-operated in all instances where they could be of assistance. The Research Committee of the Biological Board continued its courteous consideration of all fish culture problems that were referred to it.

From the spring collection of 1934 an exchange of eyed eggs was made with the Department of Game and Fisheries, Toronto, Ontario, details of which are given in a subsequent statement.

While Atlantic salmon are being taken for fish cultural purposes at Sackville river, river Philip and the Nictaux river, Nova Scotia, all that ascend above the hatchery fences and traps have to pass through the traps. This situation afforded an opportunity of observing the time of the day or night at which the movement of the fish was greatest. It was found that, at Sackville river and river Philip, approximately two-thirds of the fish ascended



during the night and the remainder during daylight. The reverse was the case at Nictaux where 77 per cent ascended during the day. The respective ascents were as follows:—

Sackville river, between 6 p.m. and 6 a.m. ....	66 per cent
River Philip, between 6 p.m. and 10.30 p.m. ....	65 per cent
Nictaux river, between 6 a.m. and 6 p.m. ....	77 per cent

## MARITIME PROVINCES EASTERN DIVISION

DISTRICT SUPERVISOR OF FISH CULTURE, JAMES CATT

The year 1934 produced meteorological phenomena that made fish cultural observations in the Eastern Division most difficult. An unprecedentedly cold and long winter, general throughout the Maritimes, was followed by a period of extreme drought in many areas. Notwithstanding these adverse conditions, the incubation of ova and the rearing and distribution of fry and fingerlings was most commendable.

In spite of the failure of the salmon run in the Nictaux river and the destruction, through freshet, of the River Philip retaining pond with the consequent loss of impounded fish, the collection of 23,972,430 salmon ova surpassed that of 1933 when 17,163,699 eggs were obtained. The collection of 12,082,495 speckled trout eggs set a new record for this species in the Eastern Division. The previous record, in 1933, amounted to 10,200,631. Rainbow trout stock produced 651,519 eggs, an increase of 200,689 over the 1933 collection.

Drought conditions rendered the capture of landlocked salmon at Chamcook lakes very difficult. A large number of the fish that usually spawn in the brook connecting the upper and lower lakes spawned elsewhere this season, thus reducing the ova collection to below normal. It is perhaps of interest to observe that during the spawning period a large school of landlocked salmon was observed by the Chief Game Warden for the province of New Brunswick making rudds near the outlet of Chamcook lake. With fair water conditions a large part of this school would undoubtedly have been captured in the main spawning brook. The collection of landlocked salmon eggs at Chamcook lakes amounted to 138,265. A further collection of 11,500 was made at Grand lake, Nova Scotia.

As far as possible, investigations were continued to determine the results of previous stocking. This work was carried out not only by officers of both branches of the department, but by duly authorized officers of the Fish and Game Protective Associations. The results of these investigations brought to light the fact that rainbow trout are thriving in Bird lake, Yarmouth county, Nova Scotia. Further reports indicate that the fish are established in Cranberry lake, Queens county, Nova Scotia, and in lake Enon, Cape Breton. In the last mentioned water a considerable number of speckled trout in addition to the rainbow trout was found.

At a meeting of the executive of the Halifax Branch of the Nova Scotia Fish and Game Protective Association, it was reported that many of the small local lakes had greatly improved since they had been stocked with fingerlings.

After placing Lochaber lake, Antigonish county, on the distribution schedule some years ago, a program of stocking it has been fulfilled, with the results that this season the wild trout collection from the lake's main feeder brook exceeded that of any previous year.

The rainbow trout from Giant's lake are reported to have spread to the mud lake draining into it. The main lake carried a large number of heavy fish throughout the season, although owing to the drought the angling was not as good as had been expected.



On the outlet brook below the screen a large number of rainbow trout fingerlings were observed during the summer. These were the natural progeny of the mature fish which, escaping during the spring freshet of 1933, descended into Duck lake. Below this lake there is an eighty foot barrier fall over which it would appear that the mature fish do not pass.

A new natural rearing pond for speckled trout was operated by the New Brunswick Fish and Game Protective Association and the Loch Lomond Protective Association. It is situated on Stephenson's brook, Loch Lomond, New Brunswick. It was stocked in the fall of 1933 with large speckled trout fingerlings. In May, 1934, the water was run off under the direction of the Biological Board. Seining, etc., was carried out by the department's fish cultural officers. The results, on the whole, were satisfactory as reported by the director of the Atlantic biological station at Saint Andrews, New Brunswick. Unfortunately, to some extent, the value of this pond was lost as the flowage was not reflooded until so late in the year that no fish smaller than large fingerlings could be supplied for it. However it is now so improved that it may be run off early next spring and immediately reflooded, thus providing a habitat for advanced fry, for which it was intended.

In the Tusket area a private enterprise has created another new natural brood pond which will not only serve as a source of supply to the rivers into which it drains, but may also prove to be a source of supply for wild trout egg collection.

The fish cultural branch in co-operation with the administrative branch of the department commenced an investigation as to the possibility of increasing and improving the salmon spawning grounds on the Mersey river. This scheme included the provision of additional rudds in suitable areas. The Inspector of Fisheries, Liverpool, Nova Scotia, laid down three of the rudds mentioned above and the results obtained provided valuable information to the effect that the spawning fish would make use of these artificial rudds if constructed in suitable positions and that the rudd material need not be made of water worn gravel—freshly broken, sharp rock appearing to be quite satisfactory.

A new departure in fish culture was carried out in Jesse lake, Nova Scotia, and had for its object the elimination of coarse fish in order that it might be restocked in the most economical manner, i.e. with fry instead of fingerlings or larger fish. This lake has an area of approximately 45 acres. Its depths reach a maximum of 21 feet and an average of 8 feet. Originally it was good speckled trout water, but owing to heavy fishing (for trout) the fish population became unbalanced, resulting in a great increase of perch and other enemy and competitor species.

The elimination of the coarse fish by means of copper sulphate was entirely satisfactory and the water will be restocked when a sufficient supply of food organisms has been re-established.

The approximate numbers of fish destroyed were:—

(1) Coarse fish, 35,013. These included white and yellow perch, catfish, eels, chub, suckers, sticklebacks and golden shiners.

(2) Speckled trout, 25. Doctor M. W. Smith of the Atlantic biological station assisted with and followed the experiment through, collecting scientific data before, during and after it. The Yarmouth Fish and Game Protective Association displayed great keenness in this work and co-operated with the department in every way. Members not only provided boats and labour, but installed a screen in the outlet of the lake to prevent enemy fish reaching the lake in the future. The officer in charge of the boy scouts patrolled the waters and generally assisted in the work, some of which, such as the collection of the dead and decomposing fish, was most unpleasant. This experimental use of copper sulphate was undertaken with the approval of the Provincial Government of Nova Scotia.

Satisfactory meetings to discuss the question of distributions were held throughout the Maritime Provinces. These meetings were called by the several supervisors of fisheries. They were attended by the fishery and hatchery officers, members of the branches of the protective associations, and in some cases by the officials of the provincial Governments. The value of these meetings increases as the requirements of the waters become better known. In connection with these requirements, it was pointed out that angling results over a short period, such as one or two seasons, do not necessarily constitute a yardstick by which the results of stocking may be measured. An increasing or decreasing visible supply of fish, easily determined during the spawning season, as a rule affords a fairly accurate medium of information on this point.

A supply of landlocked salmon and trout was provided for the ponds at Grand lake, Nova Scotia, operated by the provincial Government. The department provided a trained assistant to give instructions in the rearing of these fish.

The department furnished the protective associations with circulars describing conditions in lakes and streams under which trout will live and thrive. These circulars also explained how trout and salmon waters should be classified in order that proper allotments of fish might be distributed in them. Practical field instructions along these lines were given to members of the Fredericton, Moncton, Saint John, Saint Stephen, Yarmouth and Sydney Fish and Game Protective Associations.

The administrative branch and biological board have co-operated closely with the fish cultural officers and have rendered an increased amount of assistance. Co-operation between the provincial Governments and branches of the protective associations with the department has been excellent.

Nutritional tests were made to determine the best diet for fingerlings, etc. These were made up of beef liver, plucks, dry salmon egg meal, fresh fish and buttermilk in different combinations. The tests are being continued.

Groups of ova from a common stock at various stages of development were transferred between hatcheries to determine the safest stage at which to make shipments.

The elimination of suckers from Wilmot stream, the main trout nursery for the Loch Lomond, New Brunswick, area was continued under the direction of the Inspector of Fisheries, Saint John. Some 15,755 of these fish, weighing approximately 9.8 tons, were destroyed.

The year's operations when summed up establish the fact that the staff of the Eastern Division show an increased efficiency. On the whole they deserve the highest credit for the successful operations of this season carried out under such adverse conditions.

#### ANTIGONISH HATCHERY

*K. G. Shillington, Superintendent.*

New construction and repairs in addition to the routine work of the establishment kept the superintendent and staff extremely busy for the whole season.

An excellent distribution of speckled trout, Atlantic salmon and rainbow trout fingerlings was made. A number of yearlings and older fish of both species of trout were liberated in the area surrounding the hatchery.

Two new circular ponds were built and used to rear trout fingerlings. The two circular ponds constructed last year were this season used for speckled trout yearlings with excellent results.

A collection of 6,615,201 speckled trout eggs from pond stock was made, which although large, was smaller than had been expected. This was due to a low yield in the individual fish which may have been caused by the adverse water conditions obtaining throughout the summer. The water supply, due to



high temperature and generally dry weather, dwindled to almost half the quantity normally used. The superintendent met the situation by dredging the outlet to Loch Katrine, thus increasing the flow of South river from which the hatchery gets its supply. Provision has been made to establish a dam at the outlet of Loch Katrine next season so that a reserve of water will in future be available.

Extensive repairs were made to the hatchery dam and fishway, and a new storeroom was built adjacent to the existing garage.

Selective breeding brought to light some interesting facts. It showed that the progeny of large wild fish from date of hatch to the end of September were much smaller than selected quick growing hatchery stock—the ratio of growth being 7 to 50.5. By raising to maturity and breeding the fastest growing progeny of wild fish, results were immediately obtained, the ratio of the progeny of this stock to the selected quick growing hatchery stock being 19 to 50.5. In their third year both the quick growing stock and the wild stock made an equal growth—about 1 lb. weight per fish. In their fourth year the wild stock reached a greater size than their contemporaries of hatchery origin in the proportion of 1.6 to 1.0.

To determine the rate of growth of speckled trout fingerlings the superintendent weighed 100 average specimens on different dates. On August 31 they weighed 15.2 ounces, September 26, 50.5 ounces, December 26, 223 ounces and July 14, 700 ounces.

A very high freshet late in the fall prevented the efficient operation of the fish trap at Lochaber lake for a considerable period. Notwithstanding this a satisfactory collection of 230,055 speckled trout eggs was made at this point. From Hart lake 2,100 eggs of the same species were received. The collection of rainbow trout eggs amounted to 137,835.

In February 500,000 Atlantic salmon eyed eggs were received from Kelly's Pond hatchery. Outgoing shipments were:—250,000 speckled trout eyed eggs each to Restigouche and Miramichi hatcheries, 100,000 each to Margaree and Lindloff and 500,000 to Middleton; 500,000 Atlantic salmon eyed eggs to Lindloff. Distributions for the season were:—speckled trout 1,473,974, rainbow trout 92,312, and Atlantic salmon 1,388,228.

#### BEDFORD HATCHERY

*George Heatley, Superintendent*

The species distributed from Bedford hatchery in 1934 included Atlantic and landlocked salmon, speckled and Loch Leven trout.

A collection of landlocked salmon eggs was attempted from the Shubenacadie watershed. In this connection it had been reported that a large number of fish descended from Grand lake a short distance down the river to the spawning ground. In order to catch the fish it was necessary to establish a strong fence across the river to a point at which the spawning grounds lay. The results of the operation were not successful as only 11,500 eggs were taken, and it appears that the reported landlocked salmon spawning in this area were really small Atlantic salmon which had run up the river.

The operations, however, brought to light the value of a new form of fence in the shape of a long cylindrical drum covered with wire cloth and operated by a floating wheel. This drum does not require cleaning. It forms a perfect screen and prevents the flooding of the fence of which it is a part. Its general principle may be of the greatest importance in future where it is necessary to screen smolt, etc., from descending canals and inlets to the power plants.

The following numbers of eyed eggs were received from January to April:—872,275 speckled trout from Paradise Brook Trout Company, 100,000 salmon trout from Department of Game and Fisheries, Toronto, and 70,000 landlocked



salmon from Saint John hatchery, New Brunswick. Eggs received in November and December were:—153,000 Atlantic salmon from Sackville pond and 810,000 speckled trout from Cape Cod Trout Company.

Distributions for the year were:—Loch Leven trout 255,175, speckled trout 846,535, Atlantic salmon 1,003,380 and landlocked salmon 40,000.

#### LINDLOFF SUB-HATCHERY

*J. C. Goswell, Officer in Charge*

Excellent results obtained this season at the Lindloff sub-hatchery. The species distributed included Atlantic salmon advanced fry and fingerlings, and rainbow and speckled trout fingerlings. The percentage of loss was very low and the growth of the fish excellent.

The plant was extensively improved by the construction of four new circular ponds in that area formerly flooded by the old mill dam before its removal. The removal of this dam necessitated the construction of a new and better supply flume. This flume takes its supply directly from Lindloff lake and in addition to feeding the new ponds, will maintain a water supply for the hatchery and two older ponds.

The officer in charge is to be commended for the efficiency with which this plant is operated. Eyed eggs received during the season were:—100,000 speckled trout and 500,000 Atlantic salmon from Antigonish hatchery and 167,362 rainbow trout from Saint John hatchery. Distributions were made as follows:—Atlantic salmon 434,957, speckled trout 63,129 and rainbow trout 124,519.

#### MARGAREE HATCHERY

*W. D. Turnbull, Superintendent*

Mr. L. J. Burton, superintendent of the Margaree hatchery for many years, suffered a most regrettable stroke of paralysis early in the season. He was then superannuated and Mr. W. D. Turnbull was placed in charge of the plant.

The operation of the establishment during the season was most successful. The stock for distribution exceeded expectations in regard to size, condition and quantity. Half a million of the salmon fingerlings were at least three inches in length before liberation. The speckled trout fingerlings included specimens up to seven inches in length.

A program for improving the rearing ponds was energetically pushed through with the greatest economy and most satisfactory results.

Provision was made for an increased brood stock of speckled trout. One of the older groups of this species, all affected by thyroid tumor, was most effectively treated by introducing Lugol's solution into their feed, following the method prescribed by Doctor H. S. Davis in "Care and Diseases of Trout." Only one fish out of 250 was lost. From Antigonish hatchery 100,000 speckled trout eggs were received in April. The yield from speckled trout pond stock was 186,371 ova. From Margaree salmon pond 4,134,000 eggs were received in November and December. Of these 651,700 were from early run fish and 3,482,300 from late run. Distributions were:—Atlantic salmon 1,805,258 and speckled trout 109,516.

#### MARGAREE SALMON POND

*J. P. Chiasson, Superintendent*

A small summer run and bad storms prevented the collection of early run salmon reaching the desired number. Of the 179 early run salmon obtained the loss was 56, which includes 13 liberated before stripping began. This loss is in

excess of last season. This, however, was to be expected as the water conditions in the Margaree were much worse this year than in 1933; also the fish were very heavily parasitised with sea lice.

The fall run of salmon was satisfactory. Some 461 were impounded. The total number of eggs collected was of excellent quality. The superintendent introduced a new departure in stripping which may prove to be of considerable benefit. His method is used where the actual stripping process covers an extended period, as is often the case with heavy fish. The males are milted into the spawning pan during the stripping of the female and the ova are gently stirred throughout the operation. To date it appears that this will increase the percentage of fertile ova above the normal. The total collection was 4,134,000 ova of which 651,700 was from early run fish and 3,482,300 from late run. All eggs taken were laid down in Margaree hatchery.

#### MIDDLETON HATCHERY

*F. M. Millett, Superintendent*

Operations at Middleton hatchery were most satisfactory in 1934. The distribution included a large number of excellent specimens of trout fingerlings, exceeding the 1933 output by 127,783. These fingerlings were the subject of considerable favourable comment from residents of the area served by the plant.

In addition to speckled trout, an excellent distribution of Atlantic salmon was made—one particularly fine group being the hatch from ova obtained from the Nictaux river fish in the fall of 1933.

In January 864,612 speckled trout eggs were received from Paradise Brook Trout Company and in April 500,000 from Antigonish hatchery. In the autumn 396,000 Atlantic salmon eggs were received from Nictaux salmon pond and 131,445 from river Philip camp. In May 75,000 Atlantic salmon fry and 30,000 speckled trout fingerlings were transferred to Nictaux rearing station. Distributions from Middleton hatchery were:—Atlantic salmon 976,700 and speckled trout 731,296.

#### NICTAUX SALMON POND AND REARING STATION

*J. W. Heatley, Officer in Charge*

Owing to the great scarcity of salmon running the Annapolis watershed in 1934, a very small number of brood fish, viz. 90, were obtained for the Nictaux pond. These included an insufficient number of males to fertilize the eggs from a practical viewpoint. In order to overcome this, experimental shipments of milt were made from Miramichi and New Mills ponds. The experiment, although very interesting, did not prove a success.

In addition to the collection of brood salmon, both salmon and speckled trout fingerlings were reared in troughs at the pond. The collection of Atlantic salmon eggs amounted to 396,000 and all were laid down in Middleton hatchery. In May 75,000 Atlantic salmon fry and 30,000 speckled trout fingerlings were received from Middleton hatchery. Distributions consisted of 61,000 Atlantic salmon and 6,100 speckled trout.

#### RIVER PHILIP SALMON POND

*F. M. Millett, Superintendent*

For the second year in succession extreme floods permitted the escape of the impounded salmon in the retaining pond at the head of the Oxford canal. Before the flood, an unusual drought had checked the ascent of the brood fish. The superintendent in charge was not in any way to blame for the loss of the fish which prevented what would otherwise have been a satisfactory collection.



The number that escaped was 486. From 34 taken later 20 were stripped, yielding 131,445 eggs, which were transferred to Middleton hatchery.

### SACKVILLE RIVER SALMON POND

*George Heatley, Superintendent*

Atlantic salmon collection on the Sackville river was a failure for two reasons. The unusual drought prevented the ascent of fish which had schooled in large numbers in Bedford basin. Before the fall rise in the Sackville, the majority of these fish had apparently moved elsewhere. At any rate they did not attempt to run the river when it was in excellent condition for them to do so. Later in the fall a heavy freshet inundated the whole valley bottom including the rearing ponds at the hatchery. This flood permitted the escape of a small number of fish in pond No. 2 in the retaining canal. Repairs included a reconditioning of salmon ponds, etc. From 61 salmon stripped there was a collection of 158,000 eggs which were all laid down in Bedford hatchery, except 5,000 sent Dalhousie University, Halifax.

### YARMOUTH HATCHERY

*H. V. Gates, Superintendent*

On the whole the operations at Yarmouth hatchery were satisfactory. Ova obtained from rainbow trout were of fine quality, particularly those taken from fish in the supply trough feeding the ponds. These eggs were very red in colour and produced extremely good fingerlings, probably on account of the varied feed made available to these fish in the form of aquatic organisms including insects and small fish which, descending the pipe line, could not pass the screens separating the supply headworks from the ponds. The collection of rainbow trout eggs amounted to 81,000, which was augmented by receipt of 167,363 rainbow eggs from Saint John hatchery.

The new brook ponds proved most satisfactory as retainers for brood stock. Without them it is probable there would have been a heavy loss in the speckled trout owing to high temperature in the troughs.

The hatchery staff assisted in the experiments with copper sulphate at Jesse lake for the eradication of coarse fish.

Several reports were received commenting on the excellent condition of the fingerlings and yearlings which were delivered to very distant points. The hatchery ponds produced 658,500 speckled trout eggs. A purchase of 760,000 of this species was made from the Cape Cod Trout Company with delivery in December. From the Saint John salmon pond 764,400 Atlantic salmon eggs were received in November. Distributions were:—speckled trout 629,402, rainbow trout 170,674, and Atlantic salmon 499,313.

### BARTIBOG SALMON POND

*F. Burgess, Superintendent*

This station is an innovation intended for the retention of early run Miramichi salmon. The retainer was similar to that in use on the Morell river but with the addition of a wire guard fence outside the twine. The brood fish collected remained in fairly satisfactory condition and 97 were, on September 4, towed without loss from Bartibog to Miramichi pond at South Esk, a distance of about 18 miles. They yielded 387,074 eggs, which were laid down for incubation in Miramichi hatchery.

The first fish was captured on June 14 and the last on July 26. Of the 97 transferred to Miramichi pond 81 were females and 16 males—that is, the ratio of females to males was 83·5 to 16·5.



## CHAMCOOK COLLECTING STATION

*R. O. Barrett, Officer in Charge*

Owing to the drought, the landlocked salmon did not spawn in any quantity in the alleged main spawning ground—the brook dividing the upper and lower Chamcook lakes. As a result the collection of ova was below par in both brooks. Many fish were observed spawning along the shore of each of the lakes, but these could not be captured. From 107 fish caught 138,265 eggs were taken and all laid down in Saint John hatchery with the exception of 6,000 supplied the Biological Board.

## FLORENCEVILLE HATCHERY

*George Sutherland, Superintendent*

A good distribution of speckled trout and Atlantic salmon fingerlings was made during the early summer. In the fall the brood stock of speckled trout yielded 1,361,439 eggs of good quality.

The most important improvement to the plant was the reconstruction of number one and number two dirt ponds into circular ponds. Additions were also made to the dwelling and a new furnace and sewerage system installed.

In January 503,790 speckled trout eggs were received from Rainbow Ranch, Troy, Montana. In October and November 1,582,308 Atlantic salmon ova were transferred from Saint John salmon pond and 50,000 from Miramichi pond and hatchery. In December 800,000 speckled trout eggs were received from Cape Cod Trout Company.

Distributions were:—speckled trout 904,537 and Atlantic salmon 1,108,000.

## GRAND FALLS HATCHERY

*W. A. McCluskey, Superintendent*

The quality of both the speckled trout and Atlantic salmon stock distributed from Grand Falls hatchery in 1934 was again excellent.

The number of speckled trout ova obtained from Three Brooks stillwater, viz., 872,600, was greater than that obtained in 1933.

An attempt was made to establish circular rearing ponds from the existing system. Unfortunately the ground proved so porous that it was impossible to effect this. Five old wood-lined ponds were replaced and two others of similar type were constructed.

The Superintendent is to be commended for the general appearance of the plant and grounds—the latter are particularly attractive and have been the subject of much complimentary comment.

In February, 500,000 Atlantic salmon eggs were received from Kelly's Pond hatchery. From February to April 300,000 eggs of the same species were received from Saint John hatchery. In May 500,000 salmon eggs were shipped to the Tobique sub-hatchery. In October and November 2,201,472 Atlantic salmon green eggs were transferred from Saint John salmon pond and in December 1,080,531 speckled trout eyed eggs were received from Cape Cod Trout Company.

Distributions were:—speckled trout 1,127,371 and Atlantic salmon 1,182,135.

## MIRAMICHI HATCHERY

*Frank Burgess, Superintendent*

An excellent hatch of both salmon and trout obtained at this hatchery in the spring. This was followed by a satisfactory distribution of fingerlings. Part of the distribution from this plant was made by private sea plane carrying the fish from the hatchery to Mullins stream brook and up the waters of the Northwest Miramichi.

Improvements were made in No. 1 rearing pond in which speckled trout were released. A small number of these will be carried over as yearlings. In March 250,000 speckled trout eyed eggs were received from Antigonish hatchery. In October and November 8,780,077 Atlantic salmon green eggs were laid down from the Miramichi salmon pond—8,393,003 of these being Miramichi pond variety and 387,074 from fish transferred from Bartibog pond.

Distributions were:—Atlantic salmon 1,627,859 and speckled trout 147,802.

#### MIRAMICHI SALMON POND

*Frank Burgess, Superintendent*

Owing to a large run of fish ascending the river just before collection was commenced, total captures of brood stock were below expectations. However, the ova that were obtained from the impounded fish was of good quality, thus making the collection on the whole satisfactory.

From the 97 parent salmon transferred from Bartibog pond on September 4 there was a collection 387,074 eggs, and from salmon collected for the Miramichi pond 8,443,003 eggs, making a total collection of 8,830,077: of this number 8,780,077 were laid down in Miramichi hatchery and 50,000 transferred green to Florenceville hatchery.

#### NEW MILLS SALMON POND

*Wm. White, Superintendent*

The collection of brood fish at New Mills was better than that of preceding years. Of the 500 specimens impounded only 6 were lost. The fish, which were very large, gave an excellent yield of good quality eggs, amounting to 2,342,098 which were laid down in Restigouche hatchery.

The heavy spring freshet brought down gravel and debris which partially filled the upper end of the pond. Arrangements have been made to remove this.

#### NIPISIGUIT SUB-HATCHERY

*J. T. Comeau, Officer in Charge*

Nipisiguit sub-hatchery was satisfactorily operated during the summer. This was largely due to the excellent quality of the eggs originating from Morell river, Prince Edward Island. They arrived from Restigouche hatchery on April 5 and consisted of 396,750 Atlantic salmon ova.

Distribution was Atlantic salmon 371,827.

#### RESTIGOUCHE HATCHERY

*W. A. Mowat, Superintendent*

Routine work at the Restigouche hatchery was rendered very difficult in the spring owing to a very high freshet which partially flooded the plant. In spite of this there was a good hatch of eggs. The usual distribution of salmon was augmented by an increased output of speckled trout.

All collections of eggs were confined to salmon from the New Mills pond. The quantity and quality of these were satisfactory. In February and March 500,000 Atlantic salmon eggs from Kelly's Pond hatchery and 250,000 speckled trout eggs from Antigonish hatchery were received. From the Kelly's pond allotment 396,750 were transferred in April to Nipisiguit sub-hatchery. In October and November 2,342,098 salmon ova were received from New Mills pond.

Distributions were:—Atlantic salmon 1,097,634 and speckled trout 139,047.

## SAINT JOHN HATCHERY

*J. D. Nichol, Superintendent*

In spite of considerable loss through an epidemic in speckled trout fingerlings and brood stock, an extensive and satisfactory distribution of both salmon and trout was made from the plant this year. Collections of several species of trout eggs were satisfactory. These included the following:—Speckled trout 1,876,447, rainbow trout 432,684, brown trout hybrids (*Salmo fario* and *Salmo salar*) 11,432 and Loch Leven trout 2,205 eggs. The wooden bottoms fitting the long ponds served as a control on the parasites and proved very satisfactory.

The hatchery staff assisted in the distribution of stock from the new natural pond at Stevenson's brook, operated by the New Brunswick Fish and Game Protection Association and the Loch Lomond Protective Association.

In February 350,000 speckled trout eggs arrived from Gilbert trout hatchery, Plymouth, Mass. Experimental shipments of 300,000 Atlantic salmon eggs were made in February, March and April to Grand Falls hatchery. In April 70,000 landlocked salmon eggs were forwarded to Bedford. In May 167,363 rainbow ova were transferred to Yarmouth hatchery and 167,362 to Lindloff establishment. In November 982,254 Atlantic salmon eggs were received from the Saint John pond, and 132,265 landlocked salmon ova from Chamecook lakes. In December 550,000 speckled trout eggs arrived from Cape Cod Trout Company.

Distributions were:—Speckled trout 517,943, Atlantic salmon 362,600, landlocked salmon 40,049, rainbow trout 278, brown trout hybrids 71, brown trout albinos 6, and Loch Leven trout 4.

## SAINT JOHN SALMON POND

*J. D. Nichol, Superintendent*

The collection of brood salmon this year was confined to the June run. This supplied an adequate number of fish but unfortunately later in the year, the impounded stock showed a heavy mortality. The reason for this loss is being investigated by the Biological Board. On stripping the fish yielded 5,561,010 eggs of good quality, which were laid down as follows: at Florenceville hatchery 1,582,308, Grand Falls 2,201,472, Saint John 982,254, Biological Board, Saint Andrews 30,576 and Yarmouth hatchery 764,400.

## TOBIQUE SUB-HATCHERY

*R. O. Barrett, Officer in Charge*

A regrettable loss occurred on May 31 in the burning of the above-mentioned plant through forest fire. However, the efficiency of the fish cultural operations in New Brunswick was not affected so greatly through this loss as would have been the case a few years ago, as a greatly improved process of distribution in the Tobique area has been effected from the parent hatchery at Grand Falls. Tobique received 500,000 Atlantic salmon eggs from Grand Falls on May 2. The contents of the hatchery were not all lost as 185,000 fry were released before the fire reached the hatchery building.

## KELLY'S POND HATCHERY

*F. C. Hayley, Superintendent*

In spite of some loss in speckled trout, the condition of the quantity that was supplied was most satisfactory and a good distribution of both salmon and trout was made from this hatchery.



Collections of wild speckled trout eggs was unsatisfactory largely owing to the drought which prevented the brood stock ascending the feeder streams from Wisner's pond, one of the best speckled trout producers in the Maritimes.

In January 550,000 speckled trout eggs were received from Cape Cod Trout Company, and in February 55,800 from Ings' pond. Shipments of 500,000 Atlantic salmon eggs were made in February to Grand Falls, Restigouche and Antigonish hatcheries. In November 2,419,800 salmon eggs were laid down from Morell salmon pond and in November and December 279,782 speckled trout ova were collected from hatchery pond, Ings' and Watt's ponds.

Distributions were:—speckled trout 662,818 and Atlantic salmon 975,335.

#### MORELL RIVER SALMON POND

*A. Tait, Officer in Charge*

Since its inception this pond has been of great value in augmenting the annual supply of Atlantic salmon ova obtained in the Maritimes. The hatchery assistant from Kelly's pond hatchery, who was in charge is to be commended on the very excellent quality of the eggs obtained from this source.

Owing to a general shortage of salmon this year, the number of fish impounded was smaller than in the preceding year. However, it was more than sufficient to take care of the needs of the province with a satisfactory balance available for later distribution elsewhere. The collection amounted to 2,419,800 eggs, which were laid down in Kelly's Pond hatchery.

#### WESTERN DIVISION

*District Supervisor of Fish Culture, C. W. Harrison*

The return of parent sockeye in 1934 to all districts where the Department of Fisheries operates fish culture establishments in the province of British Columbia was most gratifying. This condition was reflected in the collections of eggs at all sockeye hatcheries, with the exception of the one located at Rivers Inlet, and this station would undoubtedly have secured its full quota had normal climatic conditions prevailed during the period in which collecting operations were conducted.

The total collection of sockeye eggs at all hatcheries in this province, where this variety of Pacific Coast salmon is handled, was 105,689,080 as against 52,925,300 secured in 1933, 87,277,285 and 98,495,273 obtained in the brood years of 1929 and 1930, respectively.

Spring salmon collections were made at the Cowichan lake, Anderson lake and Rivers Inlet hatcheries and the Sproat River eyeing station. The total number of eggs of this variety obtained was 1,541,820 as compared with 2,156,150 in 1931, 2,525,340, in 1932 and 1,737,885 in 1933. Anderson river collection was mainly responsible for the noticeable decrease of last season. Although the number of spring salmon that reached this river was below average, a greater collection would have been obtained had conditions been more favourable. Only 22,500 eggs were secured at this point as against 229,500 in 1933.

The coho run to the Cowichan lake district was below average; a small early run arrived on the spawning grounds in October but the main run which usually reaches this district in November, failed to appear in their usual numbers, consequently, the collection was smaller than in 1933, totalling 732,000 as against 1,044,000 the previous year and 714,800 in 1932.

Again, this season, experiments were conducted at the several hatcheries to determine what becomes of the eggs that remain in sockeye salmon that are liberated after they have been stripped by the expression method. As done the previous season, enclosures were installed and a male and female sockeye were placed in each, the latter having first been stripped by hand pressure. After death the

females were cut open and all eggs counted that remained in the fish. Later, the gravel in each enclosure was carefully examined and all eggs found, both dead and alive, were recorded. The following tables give the results secured at each of the fish breeding stations where this experiment was undertaken:

## ANDERSON LAKE HATCHERY

Enclosure Number	Number females	Eggs in fish after death	Recovered from gravel		Total	Per cent spawned in enclosure
			Alive	Dead		
1.....	(a) 1	1,004	.....	.....	1,004	0
2.....	1	29	737	17	783	96
3.....	1	12	1,098	22	1,132	99
4.....	1	16	1,228	117	1,361	99
		1,061	3,063	156	4,280	75

(a) Died second day.

## KENNEDY LAKE HATCHERY

1.....	1	24	506	21	551	96
2.....	1	22	21	5	48	54
3.....	1	9	1,250	367	1,626	99
4.....	1	31	994	170	1,195	97
		86	2,771	563	3,420	97

## LAKELSE LAKE HATCHERY

1.....	1	3	43	10	56	95
2.....	1	1	168	2	171	99
3.....	1	5	8	7	20	75
4.....	1	8	62	104	174	95
(b) 5.....	1	321	.....	.....	321	0
		338	281	123	742	54

(b) Female sockeye in No. 5 would not mate, although three additional males were introduced from time to time.

## PITT LAKE HATCHERY

Enclosure Number	Number females	Eggs in fish after death	Recovered from gravel		Total	Per cent spawned in enclosure
			Alive	Dead		
1.....	1	92	504	52	648	86
2.....	1	112	654	44	810	86
3.....	1	312	1,025	78	1,415	78
4.....	1	54	251	17	322	83
		570	2,434	191	3,195	82

## RIVERS INLET HATCHERY

1.....	1	5	261	4	270	98
2.....	1	5	106	1	112	96
3.....	1	33	.....	141	174	81
4.....	1	11	.....	.....	11	.....
5.....	1	12	.....	52	64	81
		66	367	198	631	90

The general results secured confirms those of the previous season and seems to prove that sockeye handled for hatchery purposes need not suffer any harm, even if only a portion of their egg content is taken from them artificially. When released they deposit their remaining eggs in equally as good condition as sockeye that have never been handled.

The program of introduction of brown or Loch Leven trout to the Cowichan and Little Qualicum rivers, Vancouver Island, was continued during the year. In March, 13,543 Loch Leven trout (No. 5 fingerlings) averaging four inches in length, were released into the Cowichan river and 37,506 brown trout (No. 4 and No. 5 fingerlings) were liberated into the Little Qualicum river and its tributaries.

In April, 13,563 Atlantic salmon (No. 5 fingerlings), resultant from a shipment of eggs received from Scotland and purchased by the Provincial Game Commission, were released from the Cowichan Lake hatchery ponds into the Cowichan river and early in July 5,781 No. 2 fingerlings of the same species escaped from a floating pond moored in that stream.

The Provincial Game Commission now operates three game fish stations, located respectively at Stanley Park, Veitch creek and Qualicum. The Commission, having no collecting camps of its own, depends upon eggs supplied by this department or purchased from other sources. Last year the department, free of charge, supplied the Commission with 610,000 Kamloops trout and 49,500 steelhead eggs. Fifty thousand eggs of the first named species were transferred from Lloyd's Creek station to the Commission's station at Stanley Park, 360,000 were shipped from Penask Lake hatchery to Veitch creek, Vancouver Island, 120,000 to Stanley Park and 80,000 from Fish lake to Dr. Duff for biological purposes. In addition, 49,500 steelhead eggs were transferred to Veitch creek from Cowichan Lake hatchery and some 170,000 brown trout fry were transferred from Cowichan Lake hatchery to Qualicum ponds.

The hatchery operated by the Cranbrook Rod and Gun Club had another successful season. In addition to replenishing local waters the collections made by the Club enabled it to sell the Department 500,000 cutthroat eyed eggs. These eggs or the fry hatched from them were allotted to waters previously stocked from the same source. Some 150,000 went to Cowichan Lake hatchery, 95,000 to Cultus Lake hatchery and 255,000 were planted direct in Nicomekl, Serpentine and other rivers and lakes.

The number of angling associations in the province which have become interested in co-operative fish culture has steadily increased, particularly in the development of rearing ponds, and every effort has been made by the department to encourage such development and to assist with both advice and practical help. The one dollar annual angler's licence administered by the Provincial Game Commission has materially assisted such efforts by providing financial assistance from this fund to organizations that had a clear cut program in view.

This year the Kelowna Rod and Gun Club commenced the development of a series of natural ponds. The success of this venture was particularly gratifying and justified further development on a much more extensive scale. A member of the department's engineering staff made a careful survey of the locality, laid out a program and submitted plans for a further extension of the system operated the previous year. The work on this expansion was completed early this summer in sufficient time to make increased accommodation available for this season's Kamloops trout fry and the department transferred from Beaver Lake station 100,000 fry and the same number of eyed eggs of this species for stocking these ponds. The eyed eggs were hatched in troughs filled with gravel and placed in a small tributary creek at the head of this retaining pond system.

The local angling association at Princeton, B.C., also improved the retaining pond established in 1933 and in view of the success achieved the previous year



were provided by the department from the Summerland hatchery, with 20,000 Kamloops trout fry as against 3,000 allotted to that organization in 1933.

The Vernon Angling Club constructed a small retaining pond system near that city. Approximately sixty feet of a small stream with a natural spring water supply was excavated to a width of eight feet and a cement retaining dam fitted with the proper screening was installed at the lower end. There is a considerable distance between this excavation and the source of the spring water supply, consequently, it collects and maintains a fairly abundant supply of natural food, therefore as conditions appeared in every way suitable for the retention of Kamloops trout fry, 15,000 were shipped from Beaver Lake hatchery and liberated in this pond.

The Revelstoke Angling Association is another organization that is taking active steps to improve the angling in its district. Again this year, the sockeye rearing station at Taft, B.C., was not required by the Biological Board and permission was given this club to use it for rearing Kamloops trout fry. The department transferred from Lloyd's Creek station 100,000 eyed eggs and the above named organization placed a man in charge and assumed all expenses in connection with the hatching and rearing of the resultant fry and their later distribution as fingerlings to lakes in the district.

The most highly developed of all co-operative fish cultural efforts undertaken by sporting organizations in this Province is that conducted by the Cranbrook Rod and Gun Club. Its operations were inaugurated in 1923 and from its inception to the present time the department has given encouragement and assistance, both financially and by loaning the services of experienced fish culture men and engineers. Its continuous success eventually resulted in the establishment of a most modern and up to date small hatchery and rearing pond system, the cost of construction of which was entirely borne by the local angling enthusiasts. The example set by this club in co-operative fish culture, will, in view of the outstanding success of its operations, undoubtedly be followed in the future by other sporting organizations in this province.

During the year, angling associations interested in lakes and streams near the coast have strongly urged that bodies of waters suitable for cutthroat trout be seeded with eyed eggs or fry secured from native stock. Unfortunately, such seed in quantity is not available, therefore, in an endeavour to provide seed of this class and conform with the wishes of these organizations, a start was made at Smiths Falls hatchery last year to raise brood stock for this purpose in one of the ponds previously used in connection with the sockeye salmon investigation. From the lower outlet to Paddy lake, Inverness district, B.C., approximately 500 cutthroat trout were salvaged on September 5. The length of these fish averaged from six to nine inches. In Boundary creek, near Greenwood in the Nelson district, water conditions were such that approximately 100 Eastern brook trout, advanced fry, became stranded and these were transferred to suitable locations on August 17. The length of the fry was approximately one and one-half inches.

Every effort has been made during the year to conform with the demand for the strictest economy without impairing the success of fish cultural operations in this division, and in view of the fact that no extensive damage was suffered at any hatchery from adverse climatic conditions during the year, the cost of operations generally, in spite of the increased collection of sockeye salmon eggs at Cultus lake, will not be increased to any great extent, if at all.

The fish cultural staff of the Western Division have, without exception, been most conscientious, faithful and unsparing in personal efforts in the execution of their duties.

## ALBERTA

## BANFF HATCHERY

*J. E. Martin, Superintendent*

The Banff hatchery, located in the National Park at Banff, Alberta, was transferred to the National Parks Branch, Department of the Interior, in 1931, when the Natural Resources were turned over to the three Prairie Provinces and is administered by the Department of Fisheries on behalf and at the expense of the Parks Branch. It covers an extensive territory and handles many different varieties of sporting fish. The greater portion of the eggs incubated at this establishment are obtained by exchange with the United States Bureau of Fisheries and by purchase from commercial firms.

Shipments received during the past year consisted of 785,600 speckled trout eggs purchased from United States firms and 163,600 collected at Vermilion lake; brown trout eggs 518,213 from Cedar Island Lodge, Brule, Wisconsin; rainbow trout eggs 108,500 (hatch) from W. S. Meader, Pocatello, Idaho, and 564,518 from Rainbow Ranch, Troy, Montana; cutthroat trout eggs 1,227,095 from Rainbow Ranch (via P. V. Klinke, Fortine, Montana), and United States Bureau of Fisheries, Yellowstone Park, Wyoming; salmon trout eggs 100,262 from Department of Game and Fisheries (via Port Arthur hatchery, Ontario), and 101,000 Kamloops trout eggs from Lloyd's Creek hatchery, British Columbia.

The total distribution of all varieties, including fry resultant from eggs received in the fall of 1933, was: cutthroat trout 1,120,425, brown trout 473,200, speckled trout 390,365, rainbow trout 540,340, salmon trout 93,654 and Kamloops trout 94,690.

It is generally considered that conditions in the wide spread district served by this hatchery have been much improved from the fish cultural operations conducted at this station.

Many lakes mentioned in past reports have greatly benefited by the artificial assistance given from Banff hatchery. The recent stocking of the following named bodies of water has also been very successful, viz.: Egypt lake, tributary to Pharaoh creek, south of Massive, was a barren water, but is now well stocked with cutthroat trout, and fish up to one pound in weight are being caught; in Ptarmigan lake, another barren water, cutthroat trout have made splendid growth and are remarkably deep and fat; there is a good showing of cutthroat trout in the middle section of the Bear Creek Valley system, and Waterfowl lakes are fairly well populated with the same species.

Loch Leven trout have been observed in tributaries to Red Deer river. In Grant and Dennison creeks several pairs of the same species have been seen, ranging from eight to fifteen inches in length.

The numerous fish and game organizations have been most generous in their co-operation. Game Wardens and Forest Rangers have been ever ready to give assistance, and pack horses have been gratuitously loaned by employees of the Game and Forestry Branches for the purpose of packing fry to outlying waters.

The help of the Director of Fisheries for Alberta and his outside staff is also gratefully acknowledged.

## JASPER PARK HATCHERY

Amethyst lake this year secured its third stocking with Kamloops trout fry. The eggs, 110,000 in number, were received in June from Lloyds creek hatchery, B.C. In February a shipment of rainbow trout eyed eggs were received from W. S. Meader, Pocatello, Idaho, out of which 384,647 hatched. In June, 202,176 cutthroat trout eggs were received from Rainbow Ranch, Troy, Montana. Distributions were: cutthroat trout 178,600; Kamloops trout 95,646; rainbow trout 333,069.



## WATERTON LAKES HATCHERY

*G. E. Bailey, Superintendent*

During the past year splendid service, as previously maintained, was given by this establishment to all accessible waters in the Waterton National Park. Many lakes and streams have been stocked with game fish with gratifying results and a general improvement in angling over the whole district is reported.

Owing to the high cost of collecting eggs from local waters, this station depends almost entirely on eggs secured from other sources. This year was no exception to the rule, and the following varieties were received:—Rainbow trout eggs from W. S. Meader, Pocatello, Idaho, of which 94,720 hatched; rainbow trout eggs from Rainbow Ranch, Troy, Montana, 613,500, and cutthroat trout eggs from the United States Bureau of Fisheries, Gardiner, Montana, 456,000.

Distributions were: cutthroat advanced fry, fingerlings and older fish, 391,755; rainbow fry, advanced fry, fingerlings and older fish, 557,935.

Two almost inaccessible barren lakes, situated within the Waterton National Park area, namely Rowe and Holroyd lakes, were stocked with cutthroat fingerlings; 2,000 were liberated in the first-named water and 5,000 in the latter. Bovin lake and Beaver creek, in the Provincial Forest Reserve, were also barren of fish until stocked last season with 5,000 fingerlings and 30,000 advanced fry, respectively.

Special work undertaken at this establishment last year consisted of construction of a rock-paved walk at the rear of hatchery, cement spillway built in lower dam, sides of ponds removed and replaced with rock and cement and bottoms paved with flat rock.

## FRASER RIVER WATERSHED

## CULTUS LAKE HATCHERY

*A. Robertson, Superintendent*

The program of the Biological Board's investigation of the efficacy of artificial versus natural propagation at Cultus lake for 1933-34 called for the planting of eyed sockeye eggs in tributaries to that lake.

The total collection of eggs of this variety of Pacific salmon secured from Sweltzer creek, the stream that drains Cultus lake, in 1933 was 4,998,900, and the number distributed in the above-mentioned way was 4,471,814. Of these, 624,438 were planted in 1933 and 3,847,376 in 1934. Normal hatchery loss and eggs transferred to the Biological Board accounted for the difference.

The distribution above mentioned commenced on December 20, 1933, and was completed on February 24, 1934. Approximately 33 per cent of the total number of eggs planted were deposited in Spring creek. This stream, as its name implies, is fed by natural springs, is not subject to freshet, and eggs planted therein should give good returns.

In accordance with the principles of modern fish culture, that part of this stream most suitable for egg-planting purposes was cleared of all debris, the stream bed thoroughly cultivated and a huge quantity of new gravel hauled and evenly distributed over the area required for the number of eggs deposited.

The remainder of the hatchery output was deposited in other tributaries to Cultus lake, and although the areas planted were thoroughly cultivated and properly prepared for reception of the eggs, it is impossible to protect against damage from freshets and resultant scouring of the beds of these streams. In March a heavy freshet occurred and it is feared that a portion of the eggs deposited may have been scoured out and consequently destroyed, but this is a condition that cannot be obviated and occurs in all sockeye spawning streams in



this province when such conditions prevail. Whether any material loss was suffered and to what extent will show when the yearling migration is counted next spring.

The extent of the 1934 sockeye run was looked forward to with a great deal of interest, as the run of 10,395 adult sockeye in 1930 was the result of the liberation of hatchery fry in 1926, when only 1,684 females provided the seed to create this run of 10,395 adult sockeye in 1930. In addition, an unknown number of Cultus lake sockeye would be taken by commercial fishermen; thus the hatchery work of 1926 undoubtedly produced splendid results. The 10,395 sockeye that returned to Cultus lake in 1930 were all allowed to spawn naturally and produced in the cycle year of 1934, 18,980 adult sockeye, consisting of 4,046 males and 14,934 females, and in addition the unknown quantity taken by commercial fishermen.

An interesting feature in connection with the increase of the sockeye run to Cultus lake during the two cycles mentioned is that in 1926, 1,684 females were used for egg collection and the number secured was 6,442,285. In 1930, the run consisted of 4,853 males and 5,542 females, thus the sexes were fairly evenly divided. At 4,000 eggs per fish, that number of females was capable of providing 22,168,000 eggs. In 1934, the adult sockeye that returned numbered 18,980, consisting of 4,046 males and 14,934 females, or sufficient of the latter to provide 59,736,000 eggs. In this connection, it will be noted the unusual predominance in numbers of females over males. Under natural spawning conditions the males and females would have paired, thus only 4,046 females could have reproduced, giving 16,184,000 eggs for seeding the spawning grounds of Cultus lake. By employing artificial methods of handling these fish, a collection of 41,350,240 eggs was secured and fertilized by the comparatively small number of males that were available.

Another interesting feature in connection with the return of adult sockeye salmon to this area, which has been noted during the last four or five years, is the increased size of the sockeye that frequent this district. For many years, both before and after the department commenced fish cultural operations in this district, the family of sockeye that frequented this particular area was considered to be an unusually small variety. A noticeable change in this respect has been taking place in recent years and last season it culminated in the fact that the sockeye that reached this district were equal in size to either Morris creek or Pemberton fish, consequently can be considered to be average sized Fraser river fish. The increase in size of this particular family of sockeye, which for many years have been to a very great extent dependent on hatchery operations, seems to refute claims made in the past that artificial operations have been in some districts responsible for a smaller class of adult sockeye.

As in 1931-32-33, the staff at this station during collecting operations largely consisted of experienced men transferred from other hatcheries where the spawning seasons are earlier than in this district. The necessity for these arrangements was due to the large number of, 41,350,240, sockeye eggs secured between November 12 and December 31. This is, I believe, the greatest individual collection of eggs of this variety of Pacific salmon ever taken in this province, although the collection from the same source in 1931 came very close to this number. In the last mentioned season, 39,388,110 sockeye eggs were obtained and that number could have been doubled if accommodation had been available.

Previous to the commencement of collecting operations, Harrison Lake hatchery was prepared to accommodate a portion of the large collection expected and during operations daily shipments of green eggs were made between the two stations until a total of 29,978,430 sockeye eggs had been laid down at Harrison Lake hatchery.

The program of distribution for this season for the Cultus lake area is again eyed egg planting, therefore, 6,432,610 sockeye eggs have been placed in Cultus Lake hatchery for that purpose. As this number, less normal losses, is all that

can be properly accommodated in the tributary streams of Cultus lake, the balance of the collection, numbering 4,939,200, has been laid down at Smiths Falls station and when the eggs are sufficiently developed will be shipped to some other district for distribution.

In connection with this collection, three valuable experiments were undertaken, namely, 221,150 eggs were fertilized with milt strained from other eggs that had received the milt direct from the males; also, 147,160 eggs were segregated to determine whether there is (and if so, to what extent) a difference in size between the water-hardened eggs and those that have almost reached the point of hatching; also, 51,940 green or water-hardened eggs were planted in a small stream in which the gravel had been cultivated and thoroughly cleaned and the resultant fry will be captured and counted when they emerge from the gravel.

A similar experiment to the above was undertaken the previous season, but instead of green, well eyed eggs were used for this purpose. Fifty thousand eyed eggs were planted in this prepared stream on February 23, 1934, and 44,699 vigorous, healthy gravel raised fry were captured in a tank constructed for that purpose when they emerged from the gravel.

Annually, considerable fish cultural work has been done in this district in connection with the propagation of steelhead. Resultant from these efforts, the run of this valuable commercial and game fish to Sweltzer creek has steadily improved and last spring 125,163 eggs of this species were secured. This is the largest collection yet obtained from this area, being 26,263 more eggs than secured the previous year, which to that time, was the record collection. These eggs were obtained between March 20 and April 27 and the resultant fry were retained and fed in the hatchery troughs until August 13 to 25 and the balance on hand then liberated in sheltered pools in Sweltzer creek where the feeding was continued for some time until they became familiar with natural conditions. When liberated, these fingerlings were one and one-half to two and three quarter inches in length and were in splendid condition.

In addition to the distribution of the fingerlings mentioned above, a further distribution of 6,579 No. 5 fingerlings that had been retained from the 1933 hatch was liberated in Sweltzer creek and when distributed had attained a length of from three to seven inches.

Four years ago, an ornamental pool, ten feet in diameter and one foot in depth, was installed in the centre of the hatchery grounds and from fifty to seventy-five cutthroat trout were placed therein last spring; 20,826 eggs were secured from this source and after deduction of normal hatchery loss, 11,749 fingerlings, ranging in length from one and one-half to two inches, were liberated in Cultus lake. In addition, 6,000 were placed in a small feeding tank near the hatchery and later 5,000 of these were transferred to one of the large retaining ponds at Smiths Falls hatchery.

In addition to the local collections and distributions of fish eggs and fry, 94,000 Kamloops trout eyed eggs were received from Lloyd's Creek eyeing station on June 21 and widely distributed in different bodies of water in the Harrison Lake and Hope districts; also, 95,000 cutthroat trout eyed eggs were received from Cranbrook hatchery and after normal hatchery loss was deducted there remained 91,526 fry which were liberated as follows: Popkum lake 25,000, Little Sumas river 40,000 and Vedder river 26,526.

Considerable improvement to the Cultus Lake hatchery grounds was made by the staff during the past year by the removal of tree stumps and by terracing of the Sweltzer creek bank. A rockery was constructed and this was abundantly planted with suitable flowering plants.

Also, the cleaning and lacquering of equipment, both at Cultus Lake and Smiths Falls hatcheries, and repairs to the Sweltzer creek fences was done during the summer. Distributions for the calendar year were: Cutthroat trout 103,275, Kamloops trout 84,055, sockeye salmon 3,899,316 and steelhead salmon 122,903.



## SMITHS FALLS HATCHERY

This establishment is under the direction of Dr. Foerster of the Pacific Biological Station and is used principally for experiments connected with fish culture. It is operated to a large extent in conjunction with, and depends almost solely on eggs or fry supplied by the Cultus Lake hatchery. Its main operation in recent years has been the retention of sockeye to varying stages of development and the accommodation of sockeye eggs or fry over and above the quantity that could not be taken care of at Cultus Lake or Harrison Lake hatcheries.

Owing to the fact that Harrison and Cultus Lake hatcheries could not accommodate the whole of the collection of sockeye eggs, the surplus, totalling 4,939,200 was laid down at this station and later, when sufficiently developed, will be transferred to another district for distribution. The distribution for the season was 99,343 sockeye.

## PEMBERTON HATCHERY

*T. W. Graham, Superintendent*

The distribution of sockeye fry resultant of the 1933 collection commenced on April 7 and was completed on May 19 when 9,977,655 free swimming sockeye fry had been liberated in the usual way by allowing them to leave the incubating troughs when so inclined and pass through a series of small natural ponds to the Birkenhead river, the stream from which the original collection had been secured.

In June, a shipment of 413,000 Kamloops trout eyed eggs was received from Lloyd's Creek station. Of these, 225,000 were distributed in Millburn, Ten Mile, McLeese, Williams, Horse, Nukko and a small lake in the northern interior of the province and the remainder was distributed direct from Pemberton hatchery as eggs or fry as conditions warranted in different bodies of water in that district. The total distribution of Kamloops trout from this station was 410,000.

The run of parent sockeye in the fall of 1934 that reached the Birkenhead river as compared with the brood year of 1930 was disappointing, although the return of parent fish was considerably more than reached the spawning area in 1933. The hatchery collection totalled 20,400,000 eggs, which was very satisfactory in view of the moderate run of fish. After completion of the collection a considerable number of sockeye spawned naturally, but very few of them had passed up stream above the hatchery fences when the fences were removed on October 1. The majority of the natural spawners deposited their eggs in the gravel bars below the fences.

This season a new departure in stripping methods at this and other stations was undertaken to determine the relative efficiency of securing eggs by hand pressure (expression) followed by incision as against full incision. Some 6,390,000 eggs were taken by the first mentioned method and 14,010,000 obtained by the latter. It is yet too early to determine which method will give the best results.

Another experiment conducted was to determine what becomes of eggs left in the fish after hand expression has been practised and the fish liberated. Unfortunately, this experiment could not be brought to a successful conclusion owing to heavy rainstorms that occurred in October and November which scoured out the gravel in the enclosures in which the male and female sockeye had been placed to complete the natural process of depositing their eggs. Although it was impossible to determine to what extent successful natural propagation had taken place, the following table indicates that the fish had extruded naturally the majority of the remaining eggs. After death, the fish were opened and the eggs therein counted.



Enclosure	Number females	Number of eggs found in dead fish
1.....	1	None
2.....	1	5
3.....	1	11
4.....	1	22

As it is generally conceded that all eggs cannot be secured by hand pressure and that usually from one to two hundred eggs are left in the fish, the above would indicate that natural extrusion had continued after these fish had been handled.

During the summer all equipment was cleaned and re-lacquered, interior of hatchery, troughs and head tank painted, ten new incubating troughs constructed and installed, a new building erected near the collecting fence and the graded portion of the hatchery grounds enlarged.

#### HARRISON LAKE HATCHERY

*C. R. T. Hearn, Superintendent*

As it was confidently expected that the run of sockeye salmon to Cultus lake would produce eggs in excess of the capacity of the Cultus and Smiths Falls hatcheries, Harrison Lake hatchery was reopened in October, necessary repairs made, and 29,978,430 sockeye eggs were transferred to it from Cultus Lake establishment.

#### PITT LAKE HATCHERY

*R. H. Eaton, Superintendent*

In view of the heavy return of sockeye salmon in the brood year of 1930, it was expected that the return for 1934 would be correspondingly heavy. These expectations materialized and the return this season was even greater than it was in the brood year. Unfortunately, the heavy natural seeding that resulted was badly damaged by the severe freshets of November which scoured the spawning grounds badly and caused the river to change its course in some places. With a view to offsetting this loss 2,920,000 eyed eggs and 150,000 green eggs were planted in Boise creek, Four Mile creek and Seven Mile slough. The areas where the damage was greatest will be further seeded with fry and local collections will be supplemented by the transfer of eggs from Cultus Lake.

The collection of sockeye eggs secured this season, totalling 3,925,000, consisted of 2,740,000 eggs obtained by hand pressure, 270,000 taken by incision after the hand expression method had been practised and 915,000 by full incision. The number last mentioned was secured in this manner to determine its efficiency as against the usual method generally practised of stripping fish by hand pressure followed by incision.

The total number of sockeye fry and fingerlings resultant of the fall collection of 1933 liberated widely in many tributaries to the Upper Pitt river in the spring of 1934, was 2,208,780. The total distribution of sockeye for the year was 5,278,780.

In June, 50,000 Kamloops trout eggs were received from Penask Lake cyeing station and after a normal loss of 490 eggs and fry, 48,510 were liberated in suitable streams in the district and 1,000 were placed in a small rearing tank for retention to the yearling stage.

Very gratifying reports have been received in connection with the introduction of Kamloops trout to this district resultant from the 1932 stocking; numbers of this variety of game fish were observed breaking water in Pitt lake and many were taken by anglers.

\*  
VANCOUVER ISLAND  
ANDERSON LAKE HATCHERY  
*D. Bothwell, Superintendent*

Distributions of sockeye and spring salmon eggs, fry and fingerlings resultant from the 1933 collection were successfully accomplished. The local distributions in Anderson lake and its tributaries during 1934 were 2,910,449 sockeye fry, 188,364 spring salmon fry and 24,582 spring salmon fingerlings. The last mentioned had been retained and fed in tanks until the end of August and when liberated were three inches in length. The fingerlings were marked by the removal of their adipose and left ventral fins.

The return of parent sockeye salmon this season to the district was estimated to be about 15,000 or double the number that reached this area in 1933. In spite of such an increase over the previous year, the return this season was disappointing when compared with the number that reached this area in the brood year of 1930 when it was estimated that 40,000 sockeye salmon appeared on the spawning grounds of Anderson lake and tributaries.

The collection was slightly more than twice as large as that of 1933, amounting to 6,741,000 eggs.

In accordance with the department's desire to determine the best method for stripping salmon, 3,801,000 eggs were taken by hand expression followed by incision and the remainder, numbering 2,940,000, was secured by full incision. Final results in this connection will not be available until later.

The run of spring salmon to Anderson river fall 1934 was also disappointing; the collection of eggs amounted to 22,500 as against 229,500 in 1933. In addition to a small run, climatic and water conditions were unfavourable. The sub-station on Sproat river was again operated and 429,000 spring salmon eggs were secured. This collection was slightly less than that of the previous season. From Sproat river 100,000 spring salmon eggs were transferred to Anderson Lake hatchery on December 31.

During the period of January 11 to 18, 449,265 spring salmon eyed eggs from the collection of 1933 were distributed in the Stamp river.

In the fall of 1934, a heavy run of adult sockeye to the Great Central and Sproat Lake systems occurred. Seventy-five thousand sockeye were taken for commercial purposes and in spite of this heavy toll, a great number passed safely to their spawning grounds. These conditions are particularly gratifying as there appears to be no doubt but that the department's fish cultural efforts are responsible for the development of these exceptionally pleasing conditions in connection with the introduction and establishment in recent years of the sockeye runs to these lakes. Previous to 1925, sockeye were unable to reach Great Central lake and the original run to Sproat lake had been practically exterminated. In 1921, the Department's Fish Cultural branch commenced the introduction of eyed eggs to suitable areas in the system and continued those operations annually until 1929. In 1925, when resultant adults from these plantings were expected, many sockeye returned. Also, from that to the present time, large numbers have passed without obstruction to Sproat lake and these with the continued plantings of eyed eggs have gradually developed a heavy annual run of fish to these spawning grounds.

In 1925 the sockeye ascending to Great Central lake were unable to pass Stamp falls, consequently no natural reproduction in this system occurred that



season. The following year, 1926, many adult sockeye again appeared at Stamp falls and employees of the fish cultural branch captured, with dip nets, 10,695 sockeye and passed them over that obstruction. As there seemed every reason to expect that this run was now established and would be maintained, the department constructed a fishway at that point. During the summer of 1927 and from then on, all salmon have had unobstructed passage to the waters above Stamp falls. The sockeye run to this district, has year by year steadily increased in size and with adequate protection, there seems no reason to doubt but that the Sproat and Great Central lakes can, in future, be made the nursery of an important commercial fishery.

Special work done during the year consisted of rearing tanks repaired, verandah roof of residence reshingled, two new boats constructed and considerable work done on spawning beaches.

#### KENNEDY LAKE HATCHERY

*W. P. Forsythe, Superintendent*

All fry resultant from the 1933 collection were transferred from the hatching troughs to retaining ponds, fed before liberation, and given a wide-spread distribution to beaches and tributaries of Kennedy and Muriel lakes. The total number liberated in this manner was 3,168,916 advanced fry and fingerlings. In addition 28,937 fry resultant from the planting of 30,000 eyed eggs in a prepared gravel bed were captured and counted when they emerged from the gravel, then placed in one of the retaining ponds and later 28,729 were released as well grown fingerlings, ranging in length from one and five-eighths to three and one-quarter inches. Thus, the total seeding of the district from the 1933 collection was 3,197,645 sockeye advanced fry and fingerlings which with 30,000 planted from the 1934 fall collection made a total output of 3,227,645.

The run of early sockeye in 1934 to the Clayoquot and Upper Kennedy rivers was poor. It is estimated that the return of parent sockeye to both rivers was less than four hundred. An effort was made to secure a collection from these fish, but owing to high water was a failure.

The late run of parent sockeye was particularly satisfactory. It was estimated that from twenty to twenty-five thousand reached Kennedy lake, consequently the hatchery was filled to capacity and all spawning areas were well seeded naturally. The Upper Kennedy river run was larger than usual; approximately two thousand parent sockeye reached that stream as against less than one hundred in the brood year of 1930. It is considered that this improvement was due to the planting of eyed sockeye eggs in that stream in 1930.

The 1934 collection totalled 8,897,300 sockeye eggs, consisting of 5,117,750 taken by hand expression followed by incision and 3,779,550 secured by full incision.

The worst freshets for many years occurred during the month of December and it is considered that a very small percentage, if any, of the eggs deposited naturally in the Clayoquot and Kennedy rivers will survive. These freshets would not affect beach spawning sockeye, thus approximately 80 per cent. of eggs naturally deposited in this district will give normal results. In addition, the hatchery collection will no doubt go far towards rectifying the damage done.

An interesting feature of the operations at this station is the efforts being made to extend the local areas frequented by sockeye salmon, particularly in connection with the introduction of sockeye to Muriel lake. This body of water was barren of fish life until its seeding from this station commenced in 1921. In 1929, the first definite results were observed and it was then estimated that from two to three thousand adult sockeye reached this lake. In 1930 approximately three hundred adults are reported to have reached these spawning



grounds. No stocking was done from eggs collected in 1927 and 1928, consequently no parent sockeye arrived at Muriel lake in the seasons of 1931 and 1932. Planting operations were resumed early in 1931 from the 1930 collection, when 150,000 eggs were deposited. The return from that seeding this fall is estimated to be from six to seven hundred adult sockeye. Scientific investigations conducted at Cultus lake show that only five per cent. of migrating sockeye yearlings can be expected to return as adults. The highest percentage of migrating yearlings at that point was 3.93 from the distribution of hatchery raised fry resultant of the 1926 collection of eggs; thus, based on a five per cent return of adults from a distribution of 150,000 fry, 295 adults might be expected to return to Cultus lake. As stated above, six to seven hundred adults are estimated to have returned to Muriel lake resultant from a seeding of 150,000 eyed eggs early in 1931.

Experiments conducted at this station during the year were: Recovery from gravel of 28,937 fry resultant from the planting of 30,000 eyed eggs in a prepared gravel bed; the planting of 30,000 green or water hardened eggs in the same prepared gravel bed, the results of which will not be available until next spring; also, four pairs of sockeye were placed in separate enclosures, the females having been stripped by hand expression. This experiment was to determine what becomes of any eggs left in female salmon after hand expression has been practised. Results from which are tabulated earlier in this report.

Unusual conditions developed during the 1934 collection owing to the high stage of water in Kennedy lake. Many sockeye would have deposited their eggs above normal lake level, thus these eggs would have been a total loss when the lake receded. To guard against such a situation, it was considered advisable to complete the collection by taking only such fish as were to be found on the area which would be left high and dry when the lake lowered to normal height. The number of eggs thus saved totalled 897,000.

Special work undertaken during the past year consisted of six new incubating troughs constructed and installed, thorough overhaul of main water supply flume, new posts installed and two hundred feet replaced, repairs to hatchery supply tank and excavation of one new retaining pond.

The superintendent developed a device for drying fish eggs for fish food which may be described as follows: It is a cylinder 10 inches in diameter and 18 inches long made of perforated zinc. Inside this cylinder is another cylinder of stove pipe 6 inches in diameter, leaving a 4-inch space between the cylinders in which the eggs are placed. One end of this double cylinder is completely blocked, and at the opposite end only the space is blocked, leaving the end of the 6-inch cylinder open for a blow torch to play inside. A small water wheel in flume revolves the cylinder, and the eggs being turned continually dry well and quickly. Four quarts of eggs can be dried at once in two to three hours, using  $1\frac{1}{2}$  pints of gasoline for the blow torch.

#### COWICHAN LAKE HATCHERY

*J. H. Castley, Superintendent*

The usual varied fish cultural operations as annually carried on at this establishment were again undertaken during the calendar year 1934. Both local and imported stock of commercial and game fish were handled. The distributions amounted to 2,409,910 as follows:—

Eyed eggs—coho salmon, 525,000; spring salmon, 75,000; Kamloops trout, 231,000.

Fry—coho salmon, 454,960; spring salmon, 359,575; Kamloops trout, 88,920; brown trout, 170,000; steelhead salmon, 109,880; cutthroat trout, 142,860.

Fingerlings—spring salmon, 216,860; Atlantic salmon, 19,391; Loch Leven trout, 13,647; brown trout, 2,817.

Eggs of the following species were imported: Kamloops trout from Penask lake, B.C., 330,000; brown trout in January from Trout Brook Company, Hudson, Wisconsin, 300,000; cutthroat trout from Cranbrook Rod and Gun Club, Cranbrook, B.C., 150,000; Atlantic salmon from Fishery Board for Scotland, 100,000, and a shipment in December, 1934, of 200,000 brown trout eggs from Rainbow Ranch, Troy, Montana. The Atlantic salmon ova were procured by the Provincial Game Board and laid down for incubation in Cowichan Lake hatchery.

In April 170,000 fry of the brown trout, resultant from the shipment of eggs received from Wisconsin on January 11 were transferred to the Qualicum Beach ponds and between October 15 and November 5, 37,506 fingerlings, ranging in length from 2½ to 3 inches, were released in Little Qualicum river and its tributaries. At the close of the calendar year there remained 85,473 which will be retained until the coming spring.

In May, 49,500 steelhead fry were transferred to the Provincial Game Board's ponds at Veitch creek for rearing and later distribution.

The run of parent steelhead to the Cowichan lake watershed was heavier than that of 1933, consequently, a larger collection of eggs of this variety of game fish was secured. The 1934 collection totalled 116,300 or 38,100 in excess of that of 1933.

There was a good average run of spring salmon to this district, but heavy floods during the collecting period seriously interfered with operations. Extreme high water at the peak of the season necessitated the lifting of the nets and as these conditions continued during the rest of the season, the total collection of 630,000 eggs was considerably less than it would have been if conditions had been more favourable. Nevertheless, the natural spawning beds will be well seeded this season.

The run of parent coho salmon to this district was considerably less than usual. A small run of early fish appeared in October, but the main run, which usually arrives about the middle of November did not make its appearance, consequently the collection of eggs from this species was much less than that of last year. A total of 732,000 eggs was secured; a decrease of 312,000 compared with the collection of 1933.

Fish traps were constructed on Beadnell creek, but unfortunately a heavy flood in the early part of the season scoured out the foundations. New foundation logs were placed under floating retaining pens and boathouse.

Owing to abnormal climatic conditions that have prevailed on this coast during the present winter, an enormous amount of damage has been done. Cowichan lake district did not escape, and on the night of December 30 the boathouse mentioned above collapsed when a heavy fall of wet snow occurred; also, two floating fry retaining enclosures moored to this boathouse broke loose and were taken down the Cowichan river and can be considered a total loss.

#### SKEENA RIVER WATERSHED

##### BABINE LAKE HATCHERY

*A. P. Hills, Superintendent*

The distribution of sockeye fry and fingerlings resultant from the 1933 collection was successfully accomplished, consisting of 2,412,518 fry, 200,000 No. 1 fingerlings and 798,694 No. 2 fingerlings, making a total of 3,411,212. The No. 1 and No. 2 fingerlings above mentioned were resultant from 1,000,000 free swimming fry placed in the retaining ponds on May 30 and fed with herring meal until July 7 and August 4, on which dates they were released.

The run of parent sockeye to Morrison creek, on which this hatchery is located, was by far the largest in the last four years. It appeared from the num-



ber that reached this creek that there was sufficient to fill the hatchery to capacity and also adequately seed all spawning areas naturally. Later, however, it was found that the sexes were very unequally divided; there proved to be at least six males to every female, consequently the collection was not as large as anticipated, although slightly larger than that of the previous year.

The total collection from Morrison creek was 3,730,000 sockeye eggs. In past seasons when the number of sockeye that reached this stream was not sufficient to fill the hatchery, it was customary to secure eggs from Babine river for that purpose. Although, generally, the run of sockeye to the entire Babine district was better than the average for the last three years, it was not equal to that of 1930, the brood year, and the number of parent sockeye that reached the spawning grounds of Babine river which drains Babine lake and from which area the auxiliary collection was expected to be obtained, was not sufficient to give the number of eggs required to fill the hatchery to full capacity. The collection at Babine river totalled 1,255,000, thus the total collection for this station was 4,985,000 eggs, or 2,815,000 eggs less than can be safely accommodated.

During the extreme high waters last spring, considerable erosion of the banks of Morrison creek occurred, and in many places log jams formed in that stream. Extra men were employed during the summer and cribbing was built to support the banks of the stream at the worst places and the log jams were removed.

Other special work undertaken during the past year was shingling the storehouse roof, placing additional insulating material between the walls and ceiling and placing an extra log wall, three feet high, on the outside around this building and filling the space between with soil. The hatchery floor was renewed.

Two methods of stripping were practised experimentally, namely, hand expression followed by incision and full incision. Results of the comparative efficiency of the two systems will not be available until all losses are known at the end of the season's operations.

#### LAKELSE LAKE HATCHERY

*C. R. T. Hearn, Superintendent*

Climatic conditions during the distribution of sockeye fry and fingerlings, resultant from the 1933 collection of eggs, were very favourable and these operations would seem to have been very successful as later large numbers of fry were seen in schools all over Lakelse lake. The total number distributed was 6,048,950, which were liberated in tributaries and suitable bays of Lakelse lake.

The return of adult sockeye salmon in 1934 to this district was larger than that of the brood year of 1930 and was almost equal to that of any previous season, consequently this hatchery was filled to full capacity, the collection totalling 8,000,000 eggs. This collection was obtained at the following named camps: Williams creek, 5,625,000, Salmon creek, 212,500, Granite creek 1,400,000 and Scullabuchan creek 762,500.

It will be noted from the above that the number secured from Scullabuchan creek was again surprisingly small. This can only be attributed to the numerous severe freshets that occurred in recent years, which have seriously damaged the spawning areas of this stream.

The run to Williams creek was exceptionally good, at least twice the number collected could easily have been secured; consequently this stream was heavily seeded naturally after collecting operations were completed. The run of sockeye to Salmon creek was the heaviest for the last five years.

Special work undertaken during the past year was: exteriors and interiors of hatchery, messhouse and superintendent's dwelling painted, auxiliary water



supply for emergency purposes installed in hatchery from spring water main, gravelling and widening of new road, repairs to cribbing and a small water wheel installed for power purposes.

## MAINLAND WEST COAST

### RIVERS INLET HATCHERY

*F. A. Tingley, Superintendent*

The distribution of sockeye and spring salmon eyed eggs, fry and fingerlings resultant from the fall collection of 1933 was successfully carried out. They were planted in suitable areas and totalled 18,257,194, consisting of 9,780,330 eyed sockeye eggs, 8,169,123 sockeye fry, 250,121 spring salmon fry and 57,620 well grown fingerlings; the latter were retained and fed in ponds until September 5 to 7 and were two and one-half to two and three-quarter inches in length. In addition to the above, 2,828 steelhead eggs were planted in a tributary stream to Walkus lake making a total output for all species of 18,260,022.

Heavy runs of parent sockeye occurred in Quap creek and Whannock river. Several streams were lightly seeded naturally but in others average returns were observed. Generally, it might be considered that the natural reproduction in this district was well up to the average and equal to that of 1932 and 1933 but lighter than that of 1931.

Heavy freshet conditions during the period the parent sockeye appear at the mouth of Quap and Genesi creeks, which usually provide all eggs necessary to fill this station, were responsible for the failure to secure a full complement of eggs. An unusually heavy run occurred at the first named stream, but the majority of these fish passed over the fences during the freshets of October 8 to 10 but later it was packed with spawning sockeye. At Genesi creek also the fish escaped over the fences and although no great numbers were later observed in that stream, it is possible that large numbers passed into the Markwell river which overflowed into Genesi creek at this time. Taking into consideration the number of sockeye seen in this stream before the fences were installed and the number that more than likely passed into the Markwell river, a fairly average run arrived at this point.

In view of the adverse conditions described above, the total collection of sockeye eggs was 11,390,540 or 6,954,360 less than secured in the fall of 1933.

The run of spring salmon to the Wauquash river was about the same as reached this stream in 1933, but considerably less than in 1930, 1931 and 1932. Nevertheless, the 1934 collection of eggs of this species totalled 460,320 or 100,185 in excess of the number obtained the previous season. Some 2,900 steelhead salmon eggs were secured from Medowse creek.

As done at other fish breeding stations during the past year, an experiment was conducted to determine what becomes of any sockeye eggs left in the female salmon after the expression method of stripping has been practised. The results obtained are listed earlier in this report. Also, two different methods of securing the eggs from sockeye salmon were tested, namely, hand expression followed by incision and full incision. Approximately 1,000,000 eggs were secured by each method. The losses will be compared later with those of other contents of this station.

Special work undertaken at this hatchery during the past year was as follows: Assembly of new 32 foot launch hull; truck road gravelled and trail to post office cleared of brush and windfalls; the hatchery sills, joists, flooring, post and wall bases were renewed over a length of approximately fifty feet; six new hatching troughs constructed; woodshed was raised; new foundations and flooring installed and the fish fences at Genesi and Quap creeks repaired and strengthened.

## SPORT FISH OPERATIONS — SOUTHERN INTERIOR

## NELSON HATCHERY

*H. C. Crawford, Superintendent*

The total number of eyed eggs, fry and fingerlings distributed from this station during the year was 1,462,319, consisting of Eastern brook trout, 80,000 eyed eggs and 175,441 fry; Kennerly's salmon, 200,000 eggs and 488,298 fry; Kamloops trout, 318,745 eggs and 199,045 fry; also 790 fingerlings that had been retained from the previous year.

Local collections consisted of 300,375 Kamloops trout eggs from Cottonwood and Six Mile lakes (109,875 and 190,500 respectively), Redfish or Kennerly's salmon eggs secured from Kokanee creek totalled 605,525 and Eastern brook trout eggs obtained from Violin lake numbered 377,030. In addition to the above, 250,000 Kamloops trout eggs were received from Penask lake hatchery.

A small retaining tank was operated inside the hatchery and 790 Kamloops trout fingerlings, two inches in length, were distributed therefrom on May 15.

Considering the heavy toll taken by anglers from the lakes and streams of this district, it is gratifying to know that most of the waters stocked are holding their own and in some instances there is a noticeable improvement in fish populations.

## ARGENTA HATCHERY \*

*H. C. Crawford, Superintendent*

Owing to difficulties that developed in connection with the water supply to the Lardo hatchery, which was obtained from Davis creek, the breaking of the dam and the frequent mud slides that occur on that stream, it was considered advisable to locate another and more suitable site. Such location was discovered on Argenta creek about two and one-half miles directly across Kootenay lake from Lardo, therefore, during the early part of the summer the necessary equipment was transferred to that point and a temporary station erected. This site was found to be in every way satisfactory and on June 29, 400,000 Kamloops trout eggs were received from Penask Lake hatchery, and laid down in Argenta hatchery. Resultant from this shipment, 377,900 free swimming fry, in splendid condition, were available for liberation at suitable points in the sheltered bays and streams around the head of Kootenay lake.

## PENASK LAKE HATCHERY

*R. H. Eaton, Superintendent*

This season fish cultural operations at this station were eminently satisfactory, although, had it been possible to foresee the more favourable conditions that developed in comparison with those of the previous season, a much greater collection of Kamloops trout eggs could have been secured. The total number of eggs obtained was 3,771,000 as against 4,002,000 in 1932 and 1,012,000 in 1933. The comparatively small collection of the last mentioned year was owing to flood conditions that submerged the fences and allowed the majority of the parent fish to escape to the upper reaches of Penask creek.

From the 1934 collection, all local waters were adequately seeded and 3,166,120 eyed eggs were transferred to other districts; Nelson hatchery received 250,000; Cranbrook 360,000; Pitt lake 50,000; Provincial Game Board for Stanley Park hatchery 120,000 and Veitch creek 360,000; Cowichan Lake hatchery 330,000; Argenta 400,000; Summerland 520,000, and various lakes and streams 776,120. The fry output was 438,665 and total distribution besides transfers to other Federal establishments was 2,054,785.



The 1934 collection from Penask creek amounted to 3,558,000 and was secured from 5,939 females and 6,019 males. After collecting operations were discontinued, approximately 8,000 parent fish were allowed to proceed to the natural spawning grounds of Penask creek. Some 213,000 Kamloops trout eggs were also taken from Spahomin creek.

Some of the definite results from the stocking of different bodies of water in the Penask and nearby districts that can be justly credited to these operations are Peterson, Jackson and Neveu lakes, all of which are producing four pound fish in good numbers, and Peter Hope lake near Merritt, B.C. The latter was first stocked in 1932. It contained no fish population of any variety and during the angling season of 1934 many large fish were observed rising in the lake and a number of six to seven pound fish were captured by sportsmen.

#### SUMMERLAND HATCHERY

*G. N. Gartrell and R. H. Eaton, Officers in Charge*

This station does not make independent collections of fish eggs but obtains its supply from other establishments and collecting camps and is utilized for distribution of eggs and fry to many streams and lakes in the Okanagan and Nicola districts. Its major supplies are shipments of Kamloops trout from Penask Lake hatchery and Kennerly's salmon from Nelson hatchery.

Resultant from the 150,000 Kennerly's salmon eggs received from Nelson hatchery on December 19, 1933, 149,200 free swimming fry were liberated into Okanagan lake in February.

Kamloops trout eggs received in June from Penask Lake and laid down in Summerland hatchery totalled 520,000. They were distributed as eyed eggs and fry in many bodies of water over a wide area. Distributions consisted of 240,000 eyed eggs and 273,402 free swimming fry.

#### LLOYD'S CREEK HATCHERY

*A. P. Hills, Superintendent*

The run of parent Kamloops trout to Paul creek was about the same as in 1933. To Pinantan creek there was a considerable increase over that of the previous year and to Knouff lake a fairly good run but unfortunately many fish escaped from the trap at that point, resulting in a small collection there.

The collection of eggs from these different bodies of water totalled 1,518,000 or 200,000 more than was obtained in 1933.

The collection of eggs from Fish lake was 1,067,950 or 99,220 less than in 1933. This collection was all laid down in Lloyd's creek hatchery except 80,000 for the Biological Board. Including Fish lake collection, the total number of Kamloops trout eggs laid down in Lloyd's Creek hatchery was 2,485,950 as against 2,485,170 the previous season. Distributions consisted of 20,000 green eggs transferred to the Biological officers for experimental purposes and 803,433 eyed eggs and 689,564 fry, making the total distribution 1,512,997. A normal loss during development occurred of 274,953 eggs and fry. Through an exchange agreement with the Provincial Department of Game and Fisheries 100,000 Kamloops eggs were sent their hatchery at Pembroke, Ontario. Pemberton hatchery received 413,000 eggs; Cultus lake hatchery 94,000; Provincial Game Board Stanley Park 50,000; Banff hatchery 101,000 and Jasper hatchery 110,000.

This season, the usual allotment of 150,000 fry to Knouff lake was reduced to 35,117. Reliable information was received that over six thousand pounds of Kamloops trout had been taken from Knouff lake this season prior to July 25 and that quantity would no doubt be greatly increased before the open season terminated.



## DEPARTMENT OF FISHERIES

## BEAVER LAKE EYEING STATION

*W. L. Goodlet, Officer in Charge*

Originally barren of fish life Beaver lake was first stocked with 5,000 Kamloops trout eyed eggs in 1926. Further introductions of eyed eggs and fry were made in 1927, 1928 and 1931. In all, 7,000 eyed eggs and 13,000 fry were distributed therein. The results from these seedings were so eminently successful that in the last few seasons this lake has become an angler's paradise. Large numbers of Kamloops trout ranging in weight from three and one half to eighteen pounds have been taken from its waters by anglers. In 1932, there were indications that intensive angling was depleting the supply, therefore, in 1933 the department took steps to maintain and increase the supply, both in Beaver lake and the tributary chain of lakes to the east.

In 1933, the necessary fish cultural equipment was brought from Summerland hatchery and an experienced employee of the Fish Cultural Branch transferred to Beaver lake. Initial operations, although conducted under difficult conditions, resulted in 128,000 eggs being secured from 36 females that were captured that season. After that collection, considerable preparatory work was done, such as installing fences and traps, and clearing logs and debris from the spawning streams to facilitate future operations. The result of such preparations proved to be justified as in 1934 247 females and 295 males were captured and stripped, from which 730,000 eggs were obtained. After deduction of a normal loss during development of 40,879, the number of eggs and fry available for distribution was 689,121 which was distributed as follows: Returned to Beaver and tributary lakes, eyed eggs 420,000 and fry 54,121; transferred to rearing ponds of Kelowna Rod and Gun Club 100,000 eyed eggs and 100,000 fry and to rearing pond of Vernon Angling Club 15,000 fry.

There seems no reason to doubt but that future collections from this system can be increased each season until the production should amply satisfy all requirements for the Okanagan district and probably provide shipments to other parts of this Province.

## CRANBROOK HATCHERY

Cranbrook fish cultural operations are entirely under the management of the local angling association. The Department assists financially by purchasing 500,000 cutthroat eggs annually at a fixed liberal price. In addition it has some seasons purchased at the prevailing market price all the eggs over and above 500,000 of which the Association had to dispose.

The total collection of cutthroat eggs secured locally was 1,494,830; hybrids cutthroat—Kamloops) 90,400 and Kamloops trout eggs obtained from Premier lake 159,700. In addition, 360,000 Kamloops trout eggs were received from the department's hatchery at Penask lake, making a total of 2,104,930 eggs handled at this station.

Including the number mentioned as supplied to the department, the distributions consisted of: Cutthroat trout eggs, 1,065,444; hybrid eggs, 50,605; Kamloops trout eggs, 82,500; cutthroat trout fry, 256,659; hybrid fry, 15,498; Kamloops trout fry, 436,364.

Total distributions to all points of eyed eggs and fry were 1,907,070.

## STATEMENT, BY SPECIES, OF LOCAL COLLECTIONS AND DISPOSAL OF EGGS DURING 1934

Species	Collection area	Number collected	Disposal	Number	Totals
Atlantic salmon	River Philip, N.S.	131,445	Middleton hatchery	131,445	
	Sackville river, N.S.	158,000	Bedford hatchery	158,000	
			Dalhousie University, N.S.	5,000	
	Margaree pond, N.S.	4,134,000	Margaree hatchery	4,134,000	
	Nictaux pond, N.S.	396,000	Middleton hatchery	396,000	
	Baribog pond, N.B.	387,074	Miramichi hatchery	387,074	
	Miramichi pond, N.B.	8,443,003	Florenceville hatchery	50,000	
			Miramichi hatchery	8,393,003	
	New Mills pond, N.B.	2,342,098	Restigouche hatchery	2,342,098	
	St. John pond, N.B.	5,561,010	Atlantic Biological Station, St. Andrews, N.B.	30,576	
Speckled trout	Morell River, P.E.I.	2,419,800	Florenceville hatchery	1,582,308	
	Antigonish hatchery ponds, N.S.	6,615,201	Grand Falls hatchery	2,201,472	
	Hart Lake, N.S.	2,100	St. John hatchery	982,254	
	Lochaber lake, Antigonish County, N.S.	230,055	Yarmouth hatchery	764,400	
	Margaree hatchery ponds, N.S.	186,371	Kelly's Pond hatchery	2,419,800	
	Yarmouth hatchery ponds, N.S.	658,500	Antigonish hatchery	6,615,201	23,972,430
	Florenceville hatchery ponds, N.B.	1,361,439	Margaree hatchery	230,055	
	Fraser's pond, Three Brooks, Victoria County, N.B.	872,600	Yarmouth hatchery	186,371	
	St. John hatchery ponds, N.B.	1,876,447	Florenceville hatchery	658,500	
			Grand Falls hatchery	1,361,439	
Landlocked salmon	Watt stream, P.E.I.	2,500	Atlantic Biological Station, St. Andrews, N.B.	872,600	
	Kelly's Pond hatchery ponds, P.E.I.	59,602	St. John hatchery	32,200	
	Ings pond, P.E.I.	217,680	Kelly's Pond hatchery	1,844,247	
	Vermilion lake, Alta.	163,600	Kelly's Pond hatchery	2,500	
	Violin lake, B.C.	377,030	Banff hatchery	59,602	
	Grand lake, N.S.	11,500	Nelson hatchery	217,680	
	Chamcook lakes, N.B.	138,265	Bedford hatchery	163,600	
			Atlantic Biological Station, St. Andrews, N.B.	377,030	12,623,125
	Sweltzer creek, Cultus lake, B.C.	41,350,240	St. John hatchery	11,500	
			Cultus lake hatchery	6,000	
Sockeye salmon	Birkenhead river, B.C.	20,400,000	Harrison lake hatchery	132,265	
	Boise creek, Pitt river, B.C.	1,455,000	Smiths Falls hatchery (Biological Board)	6,432,610	
	Charles Peter's creek, Pitt river, B.C.	750,000	Pemberton hatchery	29,978,430	
			Pitt lake hatchery	4,039,200	

STATEMENT, BY SPECIES, OF LOCAL COLLECTIONS AND DISPOSAL OF EGGS DURING 1934—*Continued*

Species	Collection area	Number collected	Disposal	Number	Totals
Sockeye salmon.....	Four Mile creek, Pitt river, B.C. Seven Mile creek, Pitt river, B.C. Quap creek, Owikeno lake, B.C. Genesi creek, Owikeno lake, B.C. Granite creek, Lakelse lake, B.C. Salmon creek, Lakelse lake, B.C. Sculabuchan creek, Lakelse lake, B.C. Williams creek, Lakelse lake, B.C. Babine river, B.C. Morrison creek, Babine lake, B.C. Anderson lake, B.C. Clayoquot Arm, Kennedy lake, B.C. Cultus lake hatchery, Fountain pond, B.C. Beaver lake, B.C. Crooked creek, Beaver lake, B.C. Echo creek, Beaver lake, B.C. Fish lake, Kamloops, B.C.  Knough lake, Kamloops, B.C. Paul lake, Kamloops, B.C.  Phantant creek, Kamloops, B.C. Cottonwood lake, Nelson, B.C. Six Mile lake, Nelson, B.C. Penask creek, Nicola Valley, B.C. Spalatin creek, Nicola Valley, B.C. St. John hatchery ponds, N.B. St. John hatchery ponds, N.B. Antigonish hatchery ponds, N.S. Yarmouth hatchery ponds, N.S. St. John hatchery ponds, N.B. Kokanee creek, B.C. Sweltzer creek, Cultus lake, B.C. Medowsee creek, B.C. Cowichan river, B.C. Cowichan river, B.C. Anderson river, B.C. Sproat river, B.C. Cowichan river, B.C. Wauquash river, Owikeno lake, B.C.	1,360,000 360,000 7,885,250 3,505,250 1,400,000 762,500 212,500 5,625,000 1,255,000 3,730,000 6,741,000 8,897,300 20,826 410,000 220,000 100,000 1,067,950  48,000 857,000  613,000 109,875 190,500 3,558,000 213,000 11,432 2,205 137,835 81,000 432,684 605,525 125,163 2,900 116,300 732,000 22,500 429,000 630,000 460,320	Pitt lake hatchery Pitt lake hatchery Rivers Inlet hatchery Rivers Inlet hatchery Lakelse lake hatchery Lakelse lake hatchery Lakelse lake hatchery Lakelse lake hatchery Babine lake hatchery Babine lake hatchery Anderson lake hatchery Kennedy lake hatchery Cultus lake hatchery Beaver lake eyeing station Beaver lake eyeing station Beaver lake eyeing station Biological Board Lloyd's creek hatchery Lloyd's creek hatchery Biological Board Lloyd's creek hatchery Nelson hatchery Nelson hatchery Penask lake hatchery St. John hatchery St. John hatchery Antigonish hatchery Yarmouth hatchery St. John hatchery Nelson hatchery Cultus lake hatchery Rivers Inlet hatchery Cowichan lake hatchery Cowichan lake hatchery Anderson lake hatchery Sproat river eyeing station Cowichan lake hatchery Rivers Inlet hatchery	1,360,000 360,000 7,885,250 3,505,250 1,400,000 762,500 212,500 5,625,000 1,255,000 3,730,000 6,741,000 8,897,300 20,826 410,000 220,000 100,000 80,000 987,950 48,000 857,000 20,000 837,000 613,000 109,875 190,500 3,558,000 213,000 11,432 2,205 137,835 81,000 432,684 605,525 125,163 2,900 116,300 732,000 22,500 429,000 630,000 460,320	105,689,080 20,826
Cutthroat trout.....					
Kamloops trout.....					
Brown trout (hybrids).....					7,387,325
Loch Leven trout.....					11,432
Rainbow trout.....					2,205
Kennerly's salmon.....					651,519
Steelhead salmon.....					605,525
Coho salmon.....					244,363
Spring salmon.....					732,000
					1,541,820
					153,631,415



## EYED EGGS PURCHASED IN 1934

Species	Month laid down	Purchased from	Laid down in hatchery	Number received	Total, by species
Atlantic salmon.	January.....	Fishery Board for Scotland, Edinburgh, Scotland.....	Cowichan lake.....	100,000	100,000
Brown trout.....	January.....	Cedar Island Lodge, Brule, Wisconsin.....	Banff.....	518,213	518,213
	February.....	Rainbow Ranch, Troy, Montana.....	Cowichan lake.....	200,000	200,000
	December.....	Trout Brook Company, Hudson, Wisconsin.....	Cowichan lake.....	300,000	300,000
Cutthroat trout.	January.....	Cranbrook Rod and Gun Club.....	Cowichan lake.....	150,000	1,018,213
	May.....	Cranbrook Rod and Gun Club.....	Cultus lake.....	95,000	95,000
	June.....	Rainbow Ranch, Troy, Montana.....	Banff.....	689,395	689,395
	May, June.....	Rainbow Ranch, Troy, Montana.....	Jasper Park.....	202,176	1,116,571
	June.....	W. S. Meader, Esq., Pocatello, Idaho (number hatched)	Banff.....	108,500	108,500
Rainbow trout.....	February.....	W. S. Meader, Esq., Pocatello, Idaho (number hatched)	Jasper Park.....	384,647	384,647
	February.....	W. S. Meader, Esq., Pocatello, Idaho (number hatched)	Waterton lakes.....	94,720	94,720
	February.....	Rainbow Ranch, Troy, Montana.....	Banff.....	162,000	162,000
	April.....	Rainbow Ranch, Troy, Montana.....	Banff.....	402,518	402,518
	June.....	Rainbow Ranch, Troy, Montana.....	Waterton lakes.....	613,500	1,765,885
	June.....	Cape Cod Trout Company, Wareham, Mass.....	Kelly's Pond.....	550,000	550,000
Speckled trout.....	January.....	Cape Cod Trout Company, Wareham, Mass.....	Pedford.....	810,000	810,000
	December.....	Cape Cod Trout Company, Wareham, Mass.....	Florenceville.....	800,000	800,000
	December.....	Cape Cod Trout Company, Wareham, Mass.....	Grand Falls.....	1,080,331	1,080,331
	December.....	Cape Cod Trout Company, Wareham, Mass.....	St. John.....	550,000	550,000
	December.....	Cape Cod Trout Company, Wareham, Mass.....	Yarmouth.....	760,000	760,000
	December.....	Gilbert Trout Company, Plymouth, Mass.....	St. John.....	350,000	350,000
	February.....	Earl Ings, Esq., Charlotetown, P.E.I.....	Kelly's Pond.....	55,800	55,800
	February.....	Paradise Brook Trout Company, Cresco, Pa.....	Pedford.....	872,275	872,275
	January.....	Paradise Brook Trout Company, Cresco, Pa.....	Middleton.....	864,612	864,612
	January.....	Rainbow Ranch, Troy, Montana.....	Florenceville.....	503,790	503,790
	January.....	Trout Brook Company, Hudson, Wisconsin.....	Banff.....	633,600	633,600
	December.....	Billy Wills, Esq., Creede, Col.....	Banff.....	152,000	7,982,608
	December.....				11,983,277

## Summary of eggs received:

Total eggs collected.....	153,631,415
Total eggs purchased.....	11,983,277
	165,614,692

Eyed eggs received 1934 from Department of Game and Fisheries, Toronto, Ontario, in exchange for Kamloops trout:  
Salmon trout from Belleville hatchery, laid down as follows,—

Pedford hatchery.....	100,000
Salmon trout from Port Arthur hatchery, laid down as follows,—	
Banff hatchery.....	100,262

Eyed eggs received 1934 from United States Bureau of Fisheries, in exchange for Atlantic salmon:

Cutthroat trout from Gardiner, Montana, U.S.A., laid down as follows,—	
Waterton Lakes hatchery.....	456,000
Cutthroat trout from Yellowstone Park, Wyoming, U.S.A., laid down as follows,—	
Banff hatchery.....	557,700

## DEPARTMENT OF FISHERIES

IN THE INTEREST OF ECONOMY AND CONVENIENCE IN THE DISTRIBUTION OF FRY  
THE FOLLOWING TRANSFERS OF EYED EGGS WERE MADE IN 1934:

Species	From	To	Number	Date received
Atlantic salmon.....	(a) Antigonish.....	Lindloff.....	500,000	April 14
	(a) Grand Falls.....	Tobique.....	500,000	May 2
	(a) Restigouche.....	Nipisiguit.....	396,750	April 5
	(a) Kelly's Pond.....	Antigonish.....	500,000	February 21
	(a) Kelly's Pond.....	Grand Falls.....	500,000	February 10
	(a) Kelly's Pond.....	Restigouche.....	500,000	February 9
Landlocked salmon..	(a) St. John.....	Grand Falls.....	300,000	February 13-April 6
	(a) St. John.....	Bedford.....	70,000	April 3
Speckled trout.....	(a) Antigonish.....	Lindloff.....	100,000	April 14
	(a) Antigonish.....	Margaree.....	100,000	April 2
	(a) Antigonish.....	Middleton.....	500,000	April 7
	(a) Antigonish.....	Miramichi.....	250,000	March 23
	(a) Antigonish.....	Restigouche.....	250,000	March 16
	(b) Lloyd's Creek.....	Banff.....	101,000	June 26
Kamloops trout.....	(b) Lloyd's Creek.....	Cultus Lake.....	94,000	June 21
	(b) Lloyd's Creek.....	Jasper Park.....	110,000	June 26
	(b) Lloyd's Creek.....	Pemberton.....	413,000	June 2
	(b) Penask Lake.....	Argenta.....	400,000	June 29
	(b) Penask Lake.....	Cowichan Lake.....	330,000	June 21
	(b) Penask Lake.....	Nelson.....	250,000	June 16
	(b) Penask Lake.....	Pitt Lake.....	50,000	June 20
	(b) Penask Lake.....	Summerland.....	520,000	June 28
	(b) St. John.....	Lindloff.....	167,362	May 19, 24
	(b) St. John.....	Yarmouth.....	167,363	May 15, 22
Sockeye salmon.....	(a) Smiths Falls.....	Cultus Lake.....	98,675	February 20
Spring salmon.....	(b) Sproat River.....	Anderson Lake.....	100,000	December 31

(a) 1933 fall collection.

(b) 1934 collection.

## MARKING OF FISH

The marking of Atlantic salmon handled for fish cultural purposes at the several salmon retaining ponds, which commenced in 1913, was continued in 1934 at Margarec, Nictaux, Sackville and Saint John ponds. Spring salmon fingerlings were marked at Anderson lake hatchery. The extent and object of marking is shown in the following statement:—

Marked and liberated at	Species	Number marked	Dates of marking	Nature of mark	Object— To throw some light on
Margarec pond, N.S. ....	Atlantic salmon, adults.....	536	Nov. 13, 15, 19, 21, 26, 28, Dec. 3, 5, 6.	Silver tag attached to dorsal fin.	The movements of Atlantic salmon in the sea, frequency in spawning and the extent to which early fish of any season return as early fish, or vice versa.
Nictaux pond, N.S. .... Sackville River, Bedford, N.S. ....	" " "	76 54	Oct. 30, Nov. 3, 10..... Nov. 12.....	" " "	" " "
St. John pond, N.B. .... Anderson river, B.C. ....	" Spring salmon, fingerlings...	2 24, 582	Sept. 4, 8..... Aug. 27, 29, 31.....	Removal of adipose and left ventral fins.	" The percentage of artificially fed fry that return as adults.



## DEPARTMENT OF FISHERIES

## RE-CAPTURES, 1934—ATLANTIC SALMON

## MARGAREE RIVER, N.S.

Number	Weight (lbs.)	Length (ins.)	Condition	Sex	Date	1. Where liberated 2. Where caught
F5891	11	32	Kelt.....	M	Dec. 11, 1933	Margaree Pond, N.S.
	10	33½	Kelt.....	M	June 16, 1934	Near Cheticamp, Inverness County, N.S.
F5967	15	37	Kelt.....	F	Nov. 28, 1933	Margaree Pond, N.S.
	11 (dressed)	.....	Clean.....	F	June 1934	Stephenville district, New- foundland.

## NICTAUX RIVER, N.S.

F5244	7	29	Kelt.....	F	Nov. 10, 1932	Nictaux Pond, N.S.
	12½	32	Clean.....	F	May 31, 1934	Lawrencetown, Annapolis river, N.S.
F5259	5	26	Kelt.....	F	Nov. 10, 1932	Nictaux Pond, N.S.
	7	.....	Clean.....	F	Nov. 1933(w)	Bauline (Pouch Cove), New- foundland.
F5325	7	29	Kelt.....	M	Nov. 14, 1932	Nictaux Pond, N.S.
	12	34	Clean.....	M	May 20, 1934	Langley pool, Annapolis river, N.S.
F5346	5	26½	Kelt.....	F	Nov. 15, 1932	Nictaux Pond, N.S.
	(u) 7	30½	Kelt.....	F	Nov. 4, 1934	Nictaux Falls, N.S.
F5360	6	29	Kelt.....	F	Nov. 15, 1932	Nictaux Pond, N.S.
	8	.....	Clean.....	F	June 26, 1934	Ramea, Labrador.

## SACKVILLE RIVER, N.S.

F5520	6 lbs.	29	Kelt.....	F	Nov. 7, 1932	Sackville river, Bedford, N.S.
	12 ozs. 12 (approx.)	.....	Clean.....	F	Sept. 12, 1934	Bedford Basin, N.S.
F5568	3 lbs.	25	Kelt.....	M	Nov. 8, 1932	Sackville river, Bedford, N.S.
	8 ozs. 14	36	Clean.....	M	Aug. 23, 1934	Bedford Basin, N.S.
F5776	15½	39	Kelt.....	F	Nov. 10, 1933	Sackville river, Bedford, N.S.
	14	.....	Kelt.....	F	May 26, 1934	Near Herring Cove, Halifax County, N.S.
F5788	7	31	Kelt.....	F	Nov. 10, 1933	Sackville river, Bedford, N.S.
	6 lbs.	31	Kelt.....	F	May 1, 1934	Sackville river (mouth of), N.S.
F5795	2 ozs.	.....	.....	.....	.....	.....
	8½	32	Kelt.....	F	Nov. 13, 1933	Sackville river, Bedford, N.S.
F5846	13½	.....	Clean.....	F	Aug. 6, 1934	Bedford Basin, N.S.
	2½	22	Kelt.....	F	Nov. 14, 1933	Sackville river, Bedford, N.S.
F5846	(u) 4	24½	Kelt.....	F	Nov. 12, 1934	Sackville river, Bedford, N.S.
	4	24	Kelt.....	M	Nov. 14, 1933	Sackville river, Bedford, N.S.
F5856	(u) 6½	29	Kelt.....	M	Nov. 12, 1934	Sackville river, Bedford, N.S.
	2	23	Kelt.....	M	Nov. 14, 1933	Sackville river, Bedford, N.S.
F5859	5	.....	Clean.....	M	Aug., 1934	Bedford Basin, N.S.
	(approx.)	.....	.....	.....	.....	.....

(u) Liberated with same tag attached.

(w) Reported in 1934.

NOVA SCOTIA  
ANTIGONISH HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 finger- lings	Rainbow trout No. 2 finger- lings	Rainbow trout 3 year olds	Speckled trout No. 1 finger- lings	Speckled trout finger- lings	Speckled trout No. 2 finger- lings	Speckled trout finger- lings	Speckled trout No. 3 finger- lings	Speckled trout finger- lings	Speckled trout year- lings	Speckled trout 2 year olds	Speckled trout 3 year olds
Antigonish Co.—													
Afton river.....		15,000											
Barney river.....		30,000											
Beaver Meadow river.....	40,000				75,000							600	
Birch Hill Lake.....													
Black river.....		50,000											
Brierly brook.....					10,000								
Copper lake.....					25,000								
DeLanuy's lake.....					10,000								
Glenroy river.....					40,000								
James river.....	25,000	45,000											
James river lake.....					15,000							600	
Lochaber lake.....					40,250					4,000			
Matties river.....		10,000											
Meadow Green river.....					40,000								
Monastery river.....		25,000											
North lake.....					30,000								
Pinevale lake.....					5,000								
Polson brook-South river.....					15,000								
South lake.....					35,000								
South river.....		100,082									6,704		
South river lake.....					55,000				8,000				
Tracadie river.....		85,000							8,000				
West river.....					70,000								
Wright river.....		50,000											
Cumberland Co.—													
Pugwash river.....													
River Philip.....		230,500			35,000		15,000					500	
Wallace river.....		49,991											
Guysborough Co.—													
Cole Harbour lake.....													
Copper lake.....							40,000						
Country Harbour river.....		75,000					25,000						
Cutler lake.....													
Donahue lake.....					45,000				15,000			600	
East River St. Mary.....	5,000	175,000											
Feun Secum river.....							25,000						
Eight Island lake.....					15,000								
Giant lake.....													
Goldboro lake.....			92,198	114									
Goshen lake.....									15,000				
Hazel Hill lake.....					15,000		31,000						

NOVA SCOTIA—ANTIGONISH HATCHERY—*Concluded*

	Atlantic salmon advanced fry	Atlantic salmon No. 1 finger-lings	Rainbow trout No. 2 finger-lings	Rainbow trout 3 year olds	Speckled trout No. 1 finger-lings	Speckled trout No. 2 finger-lings	Speckled trout No. 3 finger-lings	Speckled trout No. 4 finger-lings	Speckled trout year-lings	Speckled trout 2 year olds	Speckled trout 3 year olds
—											
Jellow lake.....					25,000		15,000			300	400
Long lake-Salmon river.....											
McPierson lake.....						45,000				700	
Salmon river.....		70,000									
Square lake.....					15,000		15,000				
Three brooks-East River St. Mary.....											
Three Mile lake.....						43,000					
West River St. Mary.....		180,000									
Pictou Co.—											
Barrow lake.....					20,000		17,500				
Battery lake.....											
Big brook-East river.....					15,000		23,000				
Big Caribou river.....					15,000		4,490				
Brota lake.....							2,000				
Calder lake.....					20,000						
Centredale lake.....					20,000						
Chistolm lake.....					10,000						
Cross brook.....											
East ver.....		72,655					2,000				
Ferguson lake.....											
French river.....	30,000				20,000						
French river, branch.....					20,000		8,000			300	
Garloch lake.....							2,500				
Graham lake.....							7,000				
Grant lake.....					10,000						
Hopewell lake.....					10,000						
Hunter lake.....					10,000						
Long lake-East River St. Mary.....							15,000				
MacDougal dam-Barney river.....					10,000		3,000				
McLean lake.....					10,000						
McLellan brook.....											
Middle river.....		25,000			15,000						
Moore lake.....					75,000					600	
River John.....					20,000		2,500				
Robertson lake.....							2,000				
Sinclair lake.....					15,000						
Stewart dam.....					10,000					300	
Taylor lake.....						23,000					
Toney river.....					15,000						
Wentworth pond.....					70,000		8,000			600	
West Branch lake.....						20,000					
West river.....											
	100,000	1,288,228	92,198	114	1,015,280	290,000	152,490	4,000	6,704	5,100	400

Total distribution.....

2,954,514



## BEDFORD HATCHERY

[illegible]

BEDFORD HATCHERY—*Concluded*

	Atlantic salmon green eggs	Atlantic salmon eyed eggs	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Landlocked salmon No. 1 finger- lings	Loch Leven trout eyed eggs	Loch Leven trout advanced fry	Speckled trout eyed eggs	Speckled trout fry	Speckled trout No. 1 finger- lings	Speckled trout No. 2 finger- lings
Hilltop lake.....											
King lake.....										5,000	
Lilly lake.....										5,000	
Mary lake.....										5,000	
Maxwell lake.....										20,000	
Moose lake.....										15,000	
Musquodoboit river.....				16,165						10,000	
Nine Mile river.....			45,000								
Ostler river.....			40,000								
Otter lake.....										15,000	
Peggy lake.....										20,000	
Pine Island lake.....										20,000	
Porter lake.....			40,000								
Ragged lake.....										5,000	
Rawdon river.....				20,000							
Sackville river.....			45,000								
Salmon river.....			35,000								
Sheldrake lake.....										20,000	
Ship lake.....				25,000							
Soldier lake.....										10,000	
Stillwater lake.....										30,000	
Tangler lake.....			30,000								
Taylor brook.....			40,000								
Hants Co.—										15,000	
McLellan lake.....											
Lunenburg Co.—											
Corkum lake.....										15,000	20,000
East river.....			40,000								
Gold river.....			70,000	30,000							
Middle river.....				25,000							
Mill lake.....											
Mush-a-Mush river.....										25,000	11,500
Queensland pond.....										30,000	
Seffernsville lake.....										5,000	
Spondo lake.....										20,000	
Tip Hill lake.....										15,000	
										5,000	
	5,500	300	851,415	146,165	40,000	200	254,975	500	300	764,000	81,735

Total distribution..... 2,145,090

## LINDLOFF SUB HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 finger- lings	Rainbow trout No. 2 finger- lings	Speckled trout No. 2 finger- lings	Speckled trout No. 3 finger- lings
Cape Breton Co.—					
Bell lake.....				10,000	
Enon lake (via Munroe lake).....			15,000		
Gaspereau river.....		22,825			2,000
Gillis lake.....				5,000	
Giovanetti lake.....				10,000	
Kelvin brook.....	22,832				2,000
Lever lake.....			39,519		
Long lake.....					2,000
McDonald lake.....					3,000
McIntyre lake.....				10,000	2,000
McMillan lake.....			30,000		
Meadow brook—Sydney river.....				2,000	
Salmon river.....		75,000			
Inverness Co.—					
Big brook—Denny's river.....		35,000			
Dolan brook—Inhabitants river.....	70,000				
Richmond Co.—					
Black river.....					2,000
Framboise river.....		90,000			
Grand river.....	90,000				
Indian lake.....				4,000	
Kyte brook—Tillard river, east.....		14,650			
Lindloff lake.....			40,000		
McRae lake.....					5,000
Morrison brook—Tillard river, west.....		14,650			
Mountain lake..... west					4,129
	182,832	252,125	124,519	41,000	22,129

Total distribution..... 622,605







## DEPARTMENT OF FISHERIES

## MIDDLETON HATCHERY

	Atlantic salmon No. 2 fingerlings	Atlantic salmon No. 3 fingerlings	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings	Speckled trout No. 3 fingerlings	Speckled trout No. 4 fingerlings	Speckled trout yearlings
Annapolis Co.—							
Allen lake (west).....				10,000			
Annapolis river.....		101,700					
Annie Morehouse lake.....				10,000			
Bear river (east branch) ..					10,000		
Crisp brook.....			5,000				
Croskil lake.....			10,000				
Elliott lake.....			10,000		2,000		100
Gesner lake.....				5,000			
Hatchery pond.....						2,000	
Hornet lake.....				5,000			
Kelly brook.....			5,000				
Lake Franklin.....				15,000			
Lake Jolly.....				15,000			
Lake LeMerchant.....				10,000			
Lequille river.....		20,000					
Lily lake.....							100
Little Bear lake.....				5,000			
Little river.....			15,000				
Long lake.....				15,000			
McGill lake.....			15,000		5,000		
Milford lake.....			15,000				
Morton brook.....			5,000				
Nictaux river.....		500,000					
Paradise brook.....			11,300				
Parker brook.....			10,000		5,500		
Quilty lake.....			10,000				
Round Hill river.....		20,000					
Sand lake.....				10,000			
Scragg lake.....				10,000			
Second Daniel lake.....				10,000			
Shannon lake.....				15,000			
Shannon river.....			15,000				
Slocumb brook.....			5,000				
Thirty lake.....			15,000				
Trout lake.....			15,000				
Waterloo lake.....				10,000			
Zwicker lake.....				15,000			96
Digby Co.—							
Haines river.....				10,000			
Harris lake.....				10,000			
Malletts lake.....				10,000			
Porter lake.....				15,000			
Hants Co.—							
Armstrong river.....					10,000		
Avon river (south branch) ..	20,000						
Avon river (west branch) ..		20,000					
Cameron lake.....				10,000			
Canoe lake.....				10,000			
Cards lake.....				20,000			
Coxcomb lake.....				10,000			
Halfway river.....					5,000		
Indian lake.....				10,000			
Kennetcook river.....		25,000					
LeBreau brook.....					5,000		
Little Meander river.....				10,000			
Little Otter lake.....				10,000			
Meander river.....	20,000						
Murphy lake.....				10,000			
Nixes lake.....				15,000			
Panuke lake.....				30,000	5,000		
Pigot lake.....			10,000				
River Herbert.....		25,000					
Zwicker lake.....				10,000			
Kings Co.—							
Aylesford lake.....			15,000				
Black River lake.....				15,000			
Cornwallis river.....		15,000					
Gaspereau river.....		25,000					
Habitant river.....			10,000				
Hardwood lake.....				15,000			



MIDDLETON HATCHERY —*Concluded*

	Atlantic salmon No. 2 fingerlings	Atlantic salmon No. 3 fingerlings	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings	Speckled trout No. 3 fingerlings	Speckled trout No. 4 fingerlings	Speckled trout yearlings
Lake George.....			15,000				
Lake Torment.....			15,000				
Murphy lake.....				15,000			
Simpson lake.....						200	
Sunken lake.....			10,000				
Trout river.....			10,000				
Lunenburg Co.—							
Gold river.....		50,000					
LaHave river.....		65,000					
Lake Louis.....				10,000			
Medway river.....		50,000					
Petite riviere.....		20,000					
Whelan lake.....				10,000			
Whetstone lake.....			10,000				
Queens Co.—							
Horse lake.....				10,000			
	40,000	936,700	256,300	425,000	47,500	2,200	296

Total distribution..... 1,707,996

## NICTAUX FALLS REARING STATION

	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings	Atlantic salmon No. 3 fingerlings	Speckled trout No. 3 fingerlings
Annapolis Co.—				
Nictaux river.....	25,000	10,000	26,000	6,100
Oakes brook.....				
	25,000	10,000	26,000	6,100

Total distribution..... 67,100







NEW BRUNSWICK  
FLORENCEVILLE HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Speckled trout advanced fry	Speckled trout No. 1 finger- lings	Speckled trout No. 3 finger- lings
Atlantic Biological Station, St. Andrews, N.B.....			1,000			
Carleton Co.—						
Beaguimee river.....		120,000				
Big Guisguir river.....				20,000	50,000	
Big Presquile river.....		90,000				
Bogan brook—South West Miramichi river.....		10,000				
Bubby brook—St. John river.....					7,000	
Bull creek—St. John river.....				10,000	40,000	
Clearwater brook—South West Mira- michi river.....		10,000				
Elliot brook—South West Miramichi river.....		20,000				
Gallivan brook—St. John river.....					6,000	
Hagerman brook—St. John river.....					20,000	
Hardwood brook—St. John river.....				15,000		
Lanes creek—St. John river.....					7,537	
Little Guisguir river.....				20,000	30,000	
Little Presquile river.....		35,000				
Little Shiktahawk river.....		35,000				
Mallory brook—St. John river.....					15,000	
Maynes brook—Presquile river.....				25,000		
McLeary brook—Lakeville pond.....					25,000	
McQuade pond—St. John river.....				40,000		
Meduxnekeag river.....		120,000				
South West Miramichi river, North Branch.....		92,000	4,000			
South West Miramichi river, South Branch.....		92,000	4,000			
Monquart river.....	60,000	40,000				
Priest brook—Shiktahawk river.....					10,000	
River de Chute.....				20,000	30,000	
Shiktahawk river.....		60,000	5,000			
Simpson brook—South West Mira- michi river.....		10,000				
Stickney brook—St. John river.....					5,000	
Teague brook—South West Miramichi river.....		10,000				
Tweedie brook—St. John river.....					5,000	
White Marsh brook—St. John river...					3,971	29
Charlotte Co.—						
Digdeguash river.....					70,000	
York Co.—						
Cross creek—Nashwaak river.....				10,000		
Davidson lake.....				35,000		
First Eel river lake.....				25,000		
Second Eel river lake.....				25,000		
Indian lake.....				25,000		
Keswick river.....		60,000		10,000		
Kingsley brook—Nashwaaksis river...				10,000		
Limekiln brook—Nashwaak river.....				10,000		
Maetaquac river.....		35,000				
McBean brook—Nashwaak river.....				10,000		
Nackawic river.....		35,000				
Nashwaak river.....		110,000				
Nashwaaksis river.....					70,000	
Nigger brook—Nackawic river.....				20,000		
Pokiok river.....					50,000	
Risteen lake.....				25,000		
Shogomoc river.....					70,000	
Skiff lake.....		50,000				
Taffa lake.....				15,000		
Taymouth brook—Nashwaak river...				10,000		
Tinkettle brook—Nashwaak river.....				10,000		
	60,000	1,034,000	14,000	390,000	514,508	29

Total distribution..... 2,012,537

## GRAND FALLS HATCHERY

	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings	Speckled trout fry	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings	Speckled trout No. 3 fingerlings
Salmon river—Victoria Co.—							
Salmon river, at Estey camp.....		10,000					
Salmon river, at Guimont lodge.....		5,000					
Salmon river, at Power's camp.....		8,000					
Salmon river, iron bridge to Danish Mill.....		8,000					
Salmon river flats.....	20,000	8,000					
Salmon river, headwaters.....	50,000	50,000					
Salmon river, mouth of.....		8,000					
East branch.....					10,000		
North branch.....					5,000		
Anderson brook.....					5,000		
Aubin crossing.....	20,000	8,000					
Barney brook.....					5,000		
Big Bogan.....	10,000	15,000					
Big brook.....					5,000		
Boat landing.....	20,000	8,000					
Cote mill.....	15,000	16,000					
Covered bridge.....	10,000	8,000					
Cyr flats.....	10,000	8,000					
Danish mill.....	10,000						
Davis mill.....	20,000	8,000					
Foley brook.....		8,000					
Grindstone brook.....					5,000		
Iron bridge.....	10,000	8,000					
Leslie brook.....					5,000		
Little Salmon river.....	40,000	10,000					
Mooney brook.....				15,000			
Otter slide.....				15,000			
Outlet brook—Little Salmon river.....			15,000				
Ryan brook.....					5,000		
Sutherland brook.....				35,000			
St. John river—Victoria Co.—							
At hatchery.....		2,135					
Andover.....		10,000					
Andover bar.....	15,000	10,000					
Andover, lower.....		10,000					
Andover, upper.....		10,000					
Argossey.....	15,000	15,000					
Aroostock bar.....	25,000						
Aroostock junction.....	25,000	20,000					
Black rapids.....		3,000					
Boutout brook.....			10,000				4,561
Costigan point.....	10,000	15,000					
Dee point.....	10,000	10,000					
Falls brook.....				10,000		3,000	
Four Falls brook.....			15,000				
Fraser's dead waters of Three brooks.....			14,000				
Gallagher flats.....	10,000						
Gallagher point.....		15,000					
Gillespie lake.....				25,000			
Hatchery brook, below falls.....						3,000	
Hitchcock flats.....	10,000	15,000					
Indian ferry.....		10,000					
Inman flats.....	35,000	20,000					
Kilburn ferry.....	35,000	15,000					
Limestone siding.....	35,000	8,000					
Little river—Grand Falls.....				50,000			
Lower Basin.....	10,000	5,000					
McLaughlin flats.....	10,000	15,000					
Morrill siding.....	25,000	15,000					
Mulherin lake.....			10,000				
Muniac river, mouth of.....	30,000	15,000					
Muniac river, upper.....		25,000					
Ortonville siding.....	25,000	15,000					
Perth Junction.....		20,000					
Perth, lower.....		10,000					
Pokiok brook.....			50,000				3,810
Price brook.....							
Tobique river, mouth of.....		20,000					
Haley brook.....		25,000					
Millers.....		50,000					
Watson flats.....	10,000	15,000					
Madawaska Co.—							
Baker lake.....				200,000			4,000
Four Mile brook.....							
Grand river.....			100,000	75,000	20,000		
Green river.....				100,000			
Iroquois river.....				50,000			
Little river.....				50,000	25,000		
Beaver brook.....					11,042		
Dead brook.....					13,000		
Head waters.....			14,958				
Perkin brook.....					8,000		
Rocky brook.....					8,000		
Madawaska river.....				25,000			
Nine Mile brook.....				15,000			
Power's creek.....				5,000			
Thompson lake.....				15,000			
Unique lake.....				65,000			
	570,000	612,135	228,958	750,000	130,042	6,000	12,371

Total distribution..... 2,309,506

## DEPARTMENT OF FISHERIES

## MIRAMICHI HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings	Speckled trout No. 3 fingerlings
Aboujogan river.....						1,800	
Bartibogue river.....		45,000	18,000				
Bass river.....		20,000					
Bay du Vin river.....		30,000	10,000				
Black river—Northumberland Co.....		45,000					
Black river—Westmorland Co.....						1,500	
Buckley lake.....					10,000		
Buctouche river.....			19,200				
Burnt Church river.....		40,000					
Caraquet river.....				12,000			600
Eagle lake.....					8,000		
Estey lake.....				6,000		162	
Elmtree river.....					6,000		
Grand Aldouane river.....						4,000	
Hashmans brook—Westmorland Co.....						1,800	
Kouchibouguac river.....			19,200				
Little river—Nipisiguit bay.....					6,000		
Little river—Westmorland Co.....						1,440	
Little South West Miramichi river.....		133,200	62,000				
Middle river.....		20,000					
Millstream—Nipisiguit bay.....					6,000		
Nappan river.....		45,000					
Nigadu river.....					6,000		
North West Miramichi river.....		281,200	95,659				
Millstream brook.....		30,000					
Mullin stream.....			5,200				
Sevogle river.....			134,400				
Stewart brook.....		20,000					
Trout brook.....		18,000					
Pokemouche river.....					10,000		
Richibucto river.....			19,200				
Shadduck lake.....				6,000			
South West Miramichi river.....		60,000					
Barnaby river.....	40,000						
East branch.....						3,000	
Bartholomew river.....	40,000						
Burntland brook.....						6,400	
Cain river.....		45,000	19,200				
Renous river.....		90,000					
Dungarvon river.....		90,000					
Taxis river.....		54,200					
Tabusintac river.....		59,200					
Eskedelloc brook.....				8,000			800
Tetagoche river.....		20,000					
Tracadie river.....				15,000			
Little Tracadie river.....				12,000			800
Votoure lake.....				10,000			
Wrigley lake.....				5,000			
	80,000	1,145,800	402,059	74,000	52,000	20,102	1,700

Total distribution..... 1,775,661

## NIPISIGUIT SUB-HATCHERY

	Atlantic salmon fry
Nipisiguit river—	
Bear island, foot of.....	40,000
Bear island, head of.....	36,000
Boudreau beach.....	36,000
Church point.....	53,827
Club House pool.....	36,000
Comeau landing.....	40,000
Gilmore brook.....	30,000
Knight brook.....	30,000
Long Meadow, head of.....	30,000
Middle beach.....	40,000
	371,827

Total distribution..... 371,827



## RESTIGOUCHE HATCHERY

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Speckled trout fry
Atlantic Biological Station, St. Andrews.....	360		50	
Black lake.....				10,000
Charlo River pond.....				60,000
Christopher brook.....				8,000
Grog brook.....				15,000
Jacquet river.....	45,590			
Little river.....				12,047
Loch Lomond.....				4,000
Middle river.....	45,000			
Restigouche river.....	377,962	250	25,775	
Little Main river.....			35,000	
Matapedia river.....	300,000		18,647	
Upsalquitch river.....	230,000		19,000	
Shippigan Gully lake.....				20,000
Walker brook.....				10,000
	998,912	250	98,472	139,047

Total distribution..... 1,236,681









St. John Co.—	10,000	10,000	25,000	2,000	5,554	1,030	370	26	56
Ball lake.....									
Black river.....									
Blindman lake.....									
Brown lake.....		5,000							
Donaldson lake.....		5,000							
Douglas lake.....		5,000							
German brook-Hammond river.....		5,000							
Grassy lake.....		5,000							
Henry lake.....		10,000							
Little river.....	50	10,000							
Loch Alva-St. John and Kings Cos.			25,000			1,030			
Loch Lomond.....									
First Loch Lomond.....									
Second Loch Lomond.....									
Third Loch Lomond.....					5,554	300			
(x) Loch Lomond rearing pond.....									
McDonald lake.....	10,000								
Milligan lake.....			5,000						
Mispok stream.....									
Rockwood Park—									
Lily lake.....			5,000				50		
Artificial lake No. 3.....	103								
Artificial lake No. 4.....	100								
Seven Mile lake.....			5,000						
Shadow lake.....									
Southern lake.....			5,000						
Tynes Mouth creek.....									
Subsidiary Co.—				2,000					
Birch lake.....									
Oromocto river.....									
Westmorland Co.—									
Bennett brook-Petitcodiac river.....									
Stoney creek pond (Electric and Gas Co.).....		10,000							
York Co.—		250							
Davis brook-Magaguadavic river.....		5,000							
Digity stream.....		5,000							
Grand lake.....		5,000							
Harvey lake.....		15,000							
Jamieson lake.....		5,000							
Lacoste brook-Palfrey lake.....		5,000							
Lake George.....		10,000							
Long creek-St. John river.....		5,000							
Man lake.....		5,000							
Mink lake.....		5,000							
Pokiok river.....		15,000							
Popal brook-Spendic lake.....		5,000							
Risteen lake.....		10,000							
Shift lake.....									
St. John river.....	10								
Trout brook-Grand lake.....		5,000							
Fredericton rearing pond No. 1.....			100						
Fredericton rearing pond No. 2.....									
Total distribution.....	266	32,200	40,000	402,950	33,000	2,100	426	1,600	56

Total distribution.....

920,951

(x)—Operated by St. John branch of the New Brunswick Fish and Game Protective Association in conjunction with the Loch Lomond Protective Association.

## TOBIQUE SUB-HATCHERY

Tobique river—	Atlantic salmon fry
Horse island brook.....	185,000
Total distribution.....	185,000

## PRINCE EDWARD ISLAND

## KELLY'S POND HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings
Kings Co.—					
Bear river.....			8,000		
Big brook-Fortune river.....				7,000	
Big pond.....				10,000	
Black pond.....				7,000	
Cardigan river, head of.....			8,000		
Collin's pond-Sturgeon river.....				5,500	
Coogan stream-Morell river.....	50,000	40,000			
Crane's, below mill-Morell river.....		50,000			
Crane's pond-Morell river.....			8,000		
East lake.....				8,000	
Fisher brook-Morell river.....			8,000		
Fortune river, head of.....		30,000			
Goose river.....			6,000		
Hay river.....			10,000		
Leard's-Morell river.....		40,500			
Lewis brook-Schooner pond.....	36,000				
McAulay brook-Morell river.....			10,000		
McEwen's pond.....				5,500	
McInnis pond-Souris river.....				7,000	
McKinnon brook-Morell river.....	50,000	1,335		5,500	
McLeod's pond-Murray river.....				10,000	
McRae's pond-Montague river.....				10,000	
Midgell river.....		40,500			
Montague pond.....			10,000		
Montague river.....		40,500			
Mooney's bridge-Morell river.....	41,000				
Mooney's pond-Morell river.....			10,000		
Mooney's stream-Morell river.....	36,000				
Naufrage river.....	40,500				
North lake.....				8,000	
Friest pond.....				7,000	
Quigley, below mill.....		30,000			
Quigley's pond.....				7,000	
Red bridge-Morell river.....	41,000				
Sturgeon river.....		38,000			
Warren's pond.....			10,000		
West river.....				7,000	
Whelan brook-Souris river.....		40,000			
Prince Co.—					
Bain creek.....				5,200	
Barlow pond-Ellis river.....				7,000	
Bell creek-Mill river.....				7,000	
Black pond.....		23,000			
Cannon's pond-Conway river.....				7,000	
Currie's pond.....				7,000	
Dunk river.....				20,000	
South West branch.....				15,000	
Gard's pond-Mill river.....				8,000	
Green stream (Miminegash).....		40,500			
Harper's pond-Tignish river.....				8,000	
Haywood's pond-Tignish river.....				8,000	
Kane's stream-Mill river.....				8,000	
Leard Brothers pond-Trout river.....				8,000	
Little Tignish river.....				8,000	
Long creek-Hill river.....				7,000	
McAusland's pond-Mill river.....				8,000	
McAusland's pond-Trout river.....				7,000	
McNeil's pond-Ellis river.....				7,000	
McWilliam's pond.....				14,000	



KELLEY'S POND HATCHERY—*Concluded*

	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 2 fingerlings
Prince Co.—					
Myrick stream-Tignish river.....				8,000	
Nail pond.....		23,000			
Reid stream (Miminegash).....		40,000			
Rix creek-Kildare river.....				7,000	
Sea Cow pond.....				5,200	
Sheep river.....				7,000	
Skinner's pond.....		23,000			
Stewart's pond.....				7,000	
Trout river.....				7,000	
Tryon river.....			6,000		
Tuplin's pond-Indian river.....				9,000	
Tyne Valley stream-Trout river.....				7,000	
Wood brook-Foxley river.....				10,400	
Wright's pond-Wilmot river.....				5,000	
Queens Co.—					
Adams pond.....				4,000	
Bagnall's pond.....			6,000		
Beer's pond-Clyde river.....			6,000		
Bell river.....				6,000	
Black river.....			6,000		
Blooming point pond.....				10,000	
Brander's pond.....				4,000	
Campbell's pond.....				6,000	
Callaghan's pond.....				7,000	
Clark stream-East river.....				7,000	
Cousin's pond.....				6,000	
Crapaud river.....			6,000		
Craswell's pond.....			8,000		
Dixon's pond-Crapaud river.....			8,000		
Eel creek-South West river.....				7,000	
Gurney's stream.....		40,000			
Hardy's pond.....				5,500	
Hillsborough river, head of.....		40,500			
Holme's pond-Sable river.....			6,000		
Hope river.....				6,000	
Lake Verde.....				12,138	
Leard's pond-Pisquid river.....				5,500	
McAulay brook.....			3,000		
McPherson's pond-Flat river.....				6,000	
McPherson's pond-Pinette river.....				6,000	
Miller brook-East river.....			4,000		
North river.....		40,000			
Parson's pond-Stanley river.....			10,000		
Rackham's pond-Wheatley river.....			10,000		
Rolling's pond.....				3,000	
Simpson's pond.....				8,138	
Smith's pond-West river.....					4,242
Stevenson's pond.....				6,000	
Stordy's pond-Crapaud river.....				6,000	
Vessey brook-Winter river.....				13,500	
Winter river.....		60,000			
East branch.....				5,500	
Wisner's pond.....				9,000	
Wood's pond-Hunter river.....			6,000		
	294,500	680,835	173,000	485,576	4,242

Total distribution..... 1,638,153







## BANFF HATCHERY—Continued

	Brown trout advanced fry	Brown trout No. 1 fingerlings	Cutthroat trout No. 1 fingerlings	Cutthroat trout No. 2 fingerlings	Kamloops trout eyed eggs	Rainbow trout advanced fry	Rainbow trout No. 1 fingerlings	Rainbow trout No. 2 fingerlings	Salmon trout advanced fry	Salmon trout No. 4 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings	Speckled trout No. 3 fingerlings	Speckled trout Old Fish
Milk river—														
Battle creek.....							20,000							
Grayburn creek.....							10,000							
Miller lake T. 24 R. 1 W. 6.....		16,000												
Moraine lake.....		16,000												
Mud lake.....		16,000												
Old Man river—														
North Willow creek.....					8,560			20,000						
Peyto creek-Peyto lake.....														
Pigeon lake-Battle river.....	40,000													
Pipestone river.....		16,000												
Piarmigan lake.....		24,000										6,000		
Raven river.....		20,000												
Beaver creek.....		10,000												
Little Beaver creek.....		5,000												
Red Deer river—														
Bearberry creek.....		20,000												
Castle creek.....		2,500												
Dennison creek.....		5,000												
Fallen Timber creek—														
Bear creek.....		5,000												
Gibson creek.....		5,000												
Grant creek.....		2,500												
Griswald creek.....		5,000												
Little Red Deer river.....		19,200												
Dog Pound creek.....	15,000													
Swanson creek.....	5,000													
Steyer creek.....		12,500												
Spring creek.....		15,000												
Twin Spring creek.....		5,000												
Waltermeyer creek.....		2,500												
Shadow lake.....			24,000											
Sherbrooke lake-Kicking Horse river.....							16,000							
Spray river—														
Goat creek.....														
Two Jacks lake.....		20,000												
Vermilion lake.....		15,000												
Vermilion river.....		25,000									50,000			
Vista lake.....		40,000												
Wabamun lake.....		15,000												
Wannick lake, T. 34, R. 6 (No. 1).....	40,000													
Wannick lake, T. 34, R. 6 (No. 2).....		5,000												
Wannick lake, T. 34, R. 6 (No. 3).....		5,000												
Wannick lake, T. 34, R. 6 (No. 4).....		2,500												
Wannick lake, T. 34, R. 6 (No. 5).....		2,500												
Wapta lake.....							15,000							
Cutnact creek.....							20,000							
Lake O'Hara.....							20,000							
Waterfowl lake, T. 33, R. 19—														
Carque lake.....														
Silverhorn creek.....		34,440												
Waterfowl creek.....		8,610												
Waterfowl creek.....		8,610												
	100,000	373,200	788,450	331,975	94,690	10,000	227,340	303,000	93,190	464	365,455	23,170	1,728	12

Total distribution.

2,712,674

## JASPER PARK HATCHERY

	Cutthroat trout fry	Kamloops trout fry	Rainbow trout fry
Amethyst lake, Tonquin valley.....		95,646	
Bench creek-McLeod river.....			10,000
Caledonia lake.....			30,000
Carrot creek-McLeod river.....			10,000
Christine lake.....	45,000		
Cold creek-Lobstick river.....			5,000
Deacon lake.....			10,000
Edson river.....			20,000
Hibernia lake.....			10,000
Horse creek-Sundance river.....			10,000
Howio creek-McLeod river.....			5,000
Keith lake.....			20,000
Lake Annette.....			10,000
Lake Edith.....			20,000
Little Hornbeck creek-Sundance river.....			15,000
Little Wolf creek.....			10,000
Marjorie lake.....			10,000
Moosehorn creek (beaver dams).....			3,000
Obed lake.....			15,000
Patricia lake.....			15,000
Pyramid lake.....			10,000
Pocahontas (beaver dams).....			18,000
Ranger creek-Athabasca river.....			15,000
Rathlin lake.....	70,000		
Rocky river, upper.....			30,069
Ronald lake.....			12,000
Sanzel lake.....			10,000
Summit lake.....	600		
Unnamed lakes (15, 20, 21-47-1, W. 6).....	3,000		
Unnamed lakes-Hay river.....			10,000
Unnamed lake-Miette river (15-45-2, W. 6).....	5,000		
Unnamed lake-Minaga lake.....	5,000		
Virl lake.....	50,000		
	178,600	95,646	333,069

Total distribution..... 607,315

## WATERTON LAKES HATCHERY

	Cutthroat trout advanced fry	Cutthroat trout No. 1 fingerlings	Cutthroat trout yearlings	Cutthroat trout fry	Rainbow trout advanced fry	Rainbow trout No. 1 fingerlings	Rainbow trout 2 year olds
Bally river—							
Indian creek.....	10,000						
Squaw creek.....	10,000						
Fry creek.....	5,000	5,000					
Bovin lake.....							
Castle river—							
Beaver dams (2-5-3, W. 5).....							
Beaver lake.....						10,000	
Beaver Mines creek.....						10,000	
Carbondale river.....						20,000	
Gladstone creek.....						10,000	
Lynx creek.....					15,000		
Mill creek.....					20,000	5,000	
North branch.....						25,000	
Carl creek.....						10,000	
Fire creek.....						10,000	
Kova creek.....						5,000	
Crowsnest lake.....						43,900	
Crowsnest river—							
Allison creek.....							
Blairmore creek.....					15,000		
Byron creek.....					20,000		
Gold creek.....					10,000		
Star creek.....					15,000		
Todd creek.....					5,000		
Lees lake.....					25,000		
Livingstone river—						5,000	
Coat creek.....		10,000					
Twin creek.....		10,000					
Rifle creek.....		5,000					
Old Man river—							
Adair creek.....	5,000						
Beaver dams (8-11-3, W. 5).....		40,000					
Beaver dams (32, 33-10-3, W. 5).....	25,000						
Beaver creek.....	30,000						
Bobs creek.....	15,000						
Barton creek.....	5,000						
Callum creek.....	10,000						
Dan on creek.....	5,000						
Ernst creek.....	5,000						
Heath creek.....	10,000						





## DEPARTMENT OF FISHERIES

BRITISH COLUMBIA  
ANDERSON LAKE HATCHERY

	Sockeye salmon fry	Spring salmon fry	Spring salmon No. 3 fingerlings
Anderson river.....		188,364	24,582
Anderson lake—			
Adlem creek.....	555,000		
Boulder creek.....	277,500		
Cabin creek.....	277,500		
Cedar creek.....	92,500		
Clemens creek.....	369,372		
Eight Mile beach.....	555,000		
Falls creek.....	185,000		
Four Mile beach.....	555,000		
Ternan creek.....	43,577		
	2,910,449	188,364	24,582

Total distribution..... 3,123,395

## ARGENTA HATCHERY

	Kamloops trout fry
Kootenay lake—	
Argenta, at.....	17,900
Argenta slough.....	60,000
Lost Ledge bay.....	150,000
Schroeder creek bay.....	150,000
	377,900
Total distribution.....	377,900

## BABINE LAKE HATCHERY

	Sockeye salmon fry	Sockeye salmon No. 1 fingerlings	Sockeye salmon No. 2 fingerlings
Morrison creek.....		200,000	798,694
Morrison lake.....	1,412,518		
Beaver lagoon.....	500,000		
Salmon river.....	500,000		
	2,412,518	200,000	798,694

Total distribution..... 3,411,212

## BEAVER LAKE EYEING STATION

	Kamloops trout eyed eggs	Kamloops trout fry
Beaver lake.....		30,121
Crooked lake.....		9,000
Echo creek.....	220,000	
Deer creek.....	200,000	
Deer lake.....		5,000
Island lake.....		10,000
Kelowna rearing ponds, Kelowna Rod and Gun Club.....	100,000	100,000
Vernon rearing pond, Vernon Angling Club.....		15,000
	520,000	169,121

Total distribution..... 689,121

## COWICHAN LAKE HATCHERY

	Atlantic salmon finger- lings	Atlantic salmon No. 5 finger- lings	Brown trout fry	Brown trout No. 1 finger- lings	Coho salmon eyed eggs	Coho salmon fry	Cut- throat trout fry	Kam- loops trout eyed eggs	Kam- loops trout fry	Loch Leven trout No. 5 finger- lings	Spring salmon eyed eggs	Spring salmon fry	Spring salmon No. 2 finger- lings	Steel- head salmon fry
Pacific Biological Station, Nanaimo, B.C.		47								104				
Burnaby lake.....														
Campbell river—														
Miller creek.....														
Quinsam river.....														
Chain lake.....	5,781	13,563												
Cowichan lake.....														
Beaver creek.....														
Lonesome lake.....														
Mead creek.....														
McKay creek.....														
Robertson river.....														
Shaw creek.....														
Sheep creek.....														
Sutton creek.....														
Cowichan river.....														
Beadnall creek.....				2,817										
Green creek.....					75,000									
Oliver creek.....					75,000									
Cushion lake.....							10,000							
Fork lake.....							10,000							
Goldstream river.....														
Heart lake.....														
Hotel lake—Pender harbour.....									5,000					
Kemp lake.....							17,000							
Kidney lake.....							5,000							
Long lake.....							10,000							
Naple Bay reservoir.....														
P. K. Lake.....									1,000					
Prospect lake.....								20,000						
Qualicum ponds (Provincial).....														
Second lake.....			170,000											
Shag lake.....														
Telord lake.....									42,000					
Telord creek.....														
Young lake.....														
Veitch creek, retaining ponds (Provincial).....														
	5,781	13,610	170,000	2,817	525,000	454,960	142,860	231,000	88,920	13,647	75,000	359,575	216,860	109,880

Total distribution..... 2,409,910



CULTUS LAKE HATCHERY

	Cut-throat trout fry	Cut-throat trout No. 2 fingerlings	Kamloops trout eyed eggs	Kamloops trout fry	Sockeye salmon green eggs	Sockeye salmon eyed eggs	Steel-head salmon No. 2 fingerlings	Steel-head salmon No. 5 fingerlings
Campbell lake.....				5,055				
Cultus lake.....		11,749						
East creek.....						321,557		
Frost creek, mouth of.....						245,270		
Smiths Falls creek.....						82,030		
Spring creek.....						552,961		
Spring creek, mouth of.....						238,670		
Watt creek.....						1,080,104		
Windfall creek.....						1,276,784		
Devil lake.....				4,000				
Eagle lake.....				5,000				
Goose lake.....				3,000				
Grace lake.....				12,000				
Hatchery creek,—Sweltzer creek.....					51,940			
Lamont lake.....				9,000				
Little Sumas river.....	40,000							
Popkum lake.....	25,000							
Silver lake.....			30,000					
Sweltzer creek.....						50,000	115,824	6,579
Vedder lake.....	26,526							
Wells ponds, Sardis.....							500	
Wolf lake.....				16,000				
	91,526	11,749	30,000	54,055	51,940	3,847,376	116,324	6,579

Total distribution..... 4,209,549

FISH LAKE CAMP

	Kamloops trout green eggs
Biological Board (Dr. Duff).....	80,000
Total distribution.....	80,000

## KENNEDY LAKE HATCHERY

	Sockeye salmon green eggs	Sockeye salmon advanced fry	Sockeye salmon No. 1 fingerlings	Sockeye salmon No. 2 fingerlings	Sockeye salmon No. 3 fingerlings	Sockeye salmon No. 4 fingerlings	Sockeye salmon No. 5 fingerlings
Kennedy lake—							
Clayoquot Arm.....							
At hatchery.....	30,000						
Cosy bay—Deer beach...		180,000	119,100				
Deer beach.....				10,000		9,456	
Duck island—Clayoquot river.....				75,000			
Fir creek-Silent bay.....							19,197
Fir creek-Yew creek.....			80,000				
Hatchery beach.....				30,000			
Irvin creek and vicinity..				15,000			
Irvin creek-Rocky bay...				23,001			
Little Pond creek.....				10,000	14,903		
Martin creek-Peter creek			80,000	24,857			
Narrows and vicinity....		239,549		25,000		8,729	
Pond beach.....			205,000	45,000	9,499		
Pond creek.....		100,000	80,000		10,000		
Rocky bay-Cosy bay.....		181,000					
Silent bay and vicinity...		100,000		25,000			
Silent bay-Narrows.....			190,000		36,410		
Charlie creek-Ucluelet bay				20,000			
Deer creek-Otter creek...			160,000				
Grant creek and south....			67,979				
Narrows-Halfway point...		189,000	50,000				
Otter creek-Charlie creek..		180,000	60,000				
Picnic beach.....			50,000				
Snag bay.....		150,000	100,000				
Ucluelet bay.....		175,000					
Muriel lake.....			49,965				
	30,000	1,494,549	1,292,044	302,858	70,812	18,185	19,197

Total distribution..... 3,227,645

## LAKELSE LAKE HATCHERY

	Sockeye salmon fry	Sockeye salmon No. 4 fingerlings
Lakelse lake.....	2,184,700	
Furlong creek.....	51,000	
Granite creek.....	357,000	800
Salmon creek.....	128,350	
Scullabuchan creek.....	1,479,100	
Williams creek.....	1,848,000	
	6,048,150	800

Total distribution..... 6,048,950

## DEPARTMENT OF FISHERIES

## LLOYDS CREEK HATCHERY

	Kamloops trout green eggs	Kamloops trout eyed eggs	Kamloops trout fry
Biological Board.....	20,000		
Hope District—			
Coquihalla river.....		40,000	
Kelly lake.....		30,000	
Pavilion lake.....		40,000	
Peckham lake.....		15,000	
Silver lake.....		30,000	
Kamloops district—			
Beaver lake.....			5,000
Brigade lake.....			5,000
Devick lake.....			5,000
Fish lake.....			250,000
Knough lake.....			35,117
Paul lake.....			200,000
Pinantan lake.....			150,000
Wallop lake.....			20,447
Pembroke hatchery (Ontario Provincial).....		100,000	
Revelstoke Rod and Gun Club—Biological Station, Taft, B.C.....		100,000	
Salmon Arm district—			
Gardiner lake (C. R. Barlow, Esq.).....			1,000
Loon lake.....			5,000
McGuire lake.....			1,500
Shuswap district—			
Canoe creek-Shuswap lake.....		60,000	
Granite creek—Shuswap lake.....		60,000	
Palmer creek-Salmon river.....		60,000	
Renickers creek-Shuswap lake.....		60,000	
Salmon river.....		60,000	
White lake.....			10,000
Cedar creek, Tappen, B.C.....		38,433	
Stanley Park hatchery.....		50,000	
Unnamed lake, near Pritchard.....			1,500
Vancouver district—			
Cannal lake.....		30,000	
Norton lake.....		30,000	
	20,000	803,433	689,564

Total distribution..... 1,512,997



## NELSON HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry	Kamloops trout No. 5 fingerlings	Kenner- ly's salmon eyed eggs	Kenner- ly's sal- mon fry	Speckled trout eyed eggs	Speckled trout fry
Creston district—							
Meadow creek—Goat river						30,000	
Grand Forks district—							
Christina lake.....	35,000						
Smelter lake.....	15,000						
Wallace lake.....		8,000					
Greenwood district—							
Boundary creek—Kettle river.....						25,000	
Jewel lake.....		20,000					
Kettle river (above West- bridge).....	20,000						
West Kootenay—							
Arrow lake, lower.....		25,000					
Arrow lake, lower (at Edgewood).....	20,000						
Arrow lake retaining ponds, Robson, B.C. (Mr. F. E. Osborne).....		1,000					
Arrow lake, upper.....	25,000						
Beatrice lake.....	20,000						
Beaver creek—Columbia river.....							20,000
Big Sheep creek.....							25,000
Bjerkness creek—Koot- enay lake.....			790				
Boundary lake.....							15,000
Corn creek.....						25,000	
Cottonwood lake.....		30,000					
Crawford bay retaining pond (Capt. Hincks).....		2,371					
Duck creek—Kootenay river.....	10,000						
Frie lake.....							20,000
Flint lake—Kaslo creek, south fork.....	10,000						
Inonoaklin river.....							25,000
Kaslo creek, north fork.....	20,000						
Kaslo creek, south fork.....							20,441
Kokanee creek.....				100,000	313,298		
Kootenay lake, west arm.....		14,674					
Kootenay river.....		30,000					
Leviathan lake.....							10,000
Loon lake.....							20,000
Milford lake.....	10,745						
Private pond, Mr. A. L. Harris, New Denver, B.C.....		2,000					
Private pond, Mr. E. New- brand, Nakusp, B.C.....		1,000					
Redfish creek.....					50,000		
Ross lake.....	8,000						
Salmon river.....	20,000						
Sitkum creek.....					75,000		
Six Mile creek.....					50,000		
Six Mile lake.....	15,000	35,000					
Slocan lake.....	30,000			50,000			
Little Slocan lakes.....							20,000
Slocan pool.....		30,000					
Slocan river.....	20,000						
Summit lake.....	10,000						
Whatshan lakes.....	30,000						
Westminster district—							
Jones lake, near Hope.....				50,000			
	318,745	199,045	790	200,000	488,298	80,000	175,441

Total distribution..... 1,462,319

## PEMBERTON HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry	Sockeye salmon fry
Alta lake.....		47,200	
Birkenhead river.....			9,977,655
Brennen lake-Howe Sound.....	10,000		
Conroy lake-Cheakamus river.....		1,900	
Eva lake-Cheakamus river.....		1,900	
Henrietta lake-Howe Sound.....	10,000		
Horse lake-Quesnel district.....	15,000		
Lac La Hache.....	40,000		
Lost lake-Cheakamus river.....	4,000		
Lower Owl creek-Birkenhead river.....	15,000		
Upper Owl creek-Birkenhead river.....	15,000		
Lucille lake.....	10,000		
McLeese lake-Quesnel district.....	50,000		
Millburn lake-Quesnel district.....	30,000		
Nukko lake-Prince George district.....	50,000		
Ogre lake-Owl creek.....	15,000		
Small lake-Prince George district.....	10,000		
Ten Mile lake-Quesnel district.....	30,000		
Tenquille lake-Birkenhead river.....	15,000		
Williams lake-Quesnel district.....	40,000		
	359,000	51,000	9,977,655
Total distribution.....	10,387,655		

## PENASK LAKE HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry
Cameron lake.....	80,000	
Cariboo lake.....	50,000	
Cranbrook Hatchery (Cranbrook Rod and Gun Club).....	360,000	
Great Central lake.....	80,000	
Jackson lake.....		20,000
Link lake.....	70,000	
Neveu lake.....		10,000
Okanagan lake—		
Chute creek.....	40,000	
Deep creek.....	40,000	
Peach Orchard creek.....	136,120	
Penask lake.....		378,665
Mud lake.....		20,000
Peterson lake.....		10,000
Powell lake.....	70,000	
Similkameen river—		
Ashnola creek.....	30,000	
Missezula lake.....	40,000	
Otter lake.....	30,000	
Wolfe lake.....	30,000	
Sproat lake.....	80,000	
Stanley Park hatchery.....	120,000	
Veitch creek pond (Provincial).....	360,000	
	1,616,120	438,665
Total distribution.....	2,054,785	

## PITT LAKE HATCHERY

	Kamloops trout fry	Sockeye salmon green eggs	Sockeye salmon eyed eggs	Sockeye salmon fry	Sockeye salmon No. 1 fingerlings
Pitt river—					
Boise creek.....		150,000	1,640,000	390,000	
Cox's slough.....	10,000				
Four Mile creek.....			800,000	200,000	149,930
Four Mile slough.....	20,000			368,850	
Mountain slough.....				220,000	
Peter's slough.....				440,000	
Seven Mile creek.....	18,510			440,000	
Seven Mile slough.....			480,000		
	48,510	150,000	2,920,000	2,058,850	149,930

Total distribution..... 5,327,290

## QUALICUM BEACH PONDS

(Provincial)

	Brown trout No. 4 fingerlings	Brown trout No. 5 fingerlings
Biological Research.....	100	
Little Qualicum river.....	1,573	4,500
Arrowsmith slough.....	2,000	4,000
Chatsworth creek.....		1,000
Lockwood creek.....		5,200
Whiskey creek.....	10,969	6,600
Little creek.....		1,564
	14,642	22,864

Total distribution..... 37,506

## RIVERS INLET HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry	Spring salmon fry	Spring salmon No. 4 fingerlings	Steelhead salmon eyed eggs
Owikeno lake.....				57,620	
Askum creek.....		1,493,860			
Cheo river.....		921,396			
Dallick river.....		894,133			
Genesi creek.....	3,223,535	674,099			
Indian river.....		897,268			
Markwell river.....		774,088			
Medowse creek.....			87,496		
Nookins river.....	1,594,655				
Quap creek.....	529,775	2,514,279			
Second Narrows.....			162,625		
Shumahault river.....	2,932,365				2,828
Waikus lake.....					
Wauquash river.....	1,500,000				
	9,780,330	8,169,123	250,121	57,620	2,828

Total distribution..... 18,260,022



DEPARTMENT OF FISHERIES

SMITHS FALLS HATCHERY

	Sockeye salmon No. 1 fingerlings	Sockeye salmon No. 2 fingerlings	Sockeye salmon No. 3 fingerlings	Sockeye salmon No. 5 fingerlings
Cultus lake.....	3,100	28,143	25,000	40,000
Pacific Biological Station, Nanaimo, B.C.....	3,100			
	6,200	28,143	25,000	40,000

Total distribution..... 99,343

SPROAT RIVER EYEING STATION

Somass river—	Spring salmon eyed eggs
Stamp river-Alberni district.....	449,265
Total distribution.....	449,265

SUMMERLAND HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry	Kennerly's salmon fry
Clearwater lake-Salmon river (Keremoes, B.C.).....	30,000		
Okanagan district—			
Chute lake.....		10,000	
Dog (Shaha) lake.....	40,000		
Fish lake-Summerland.....		10,000	
Hill lake.....		15,000	
Island lake.....		20,000	
Long lake, Vernon, B.C.....		30,000	
Okanagan lake.....		58,402	149,200
Osoyoos lake.....	30,000		
Silver lake.....		5,000	
Woods lake.....		20,000	
Pillar lake-Salmon river, Falkland, B.C.....		30,000	
Shuswap district—			
Echo lake.....		10,000	
Mable lake.....	70,000		
Sugar lake.....	40,000		
Similkameen river—			
Blue lake.....		20,000	
Davis lake.....		10,000	
Osprey lake.....		10,000	
Princeton Rod and Gun Club.....		20,000	
Roche river.....	30,000		
Wolf lake.....		5,000	
	240,000	273,402	149,200

Total distribution..... 662,602

## APPENDIX NO. 4.

### REPORT OF INSPECTION OF FISH AND TECHNICAL INSTRUCTION TO FISHERMEN AND FISHERY OFFICERS

*By J. J. Cowie, Director*

#### INSPECTION OF SALTED MACKEREL, HERRING, ETC.

The compulsory inspection of pickled or salted fish and the barrels or packages in which such fish are marketed was continued under authority of the Fish Inspection Act during 1934. The inspections were carried out by those fishery officers of the department who had undergone training and had qualified as inspectors for this work.

#### *Atlantic Coast*

From the 1st of April, 1934, to the 31st of March, 1935, the fishery officers of the Atlantic coast inspected 82,436 empty barrels or packages before they were allowed to be used by the industry. Of these 547 were found to be below the specified standard. There were 41,652 packages of mackerel inspected and of these 706 were found to be below quality. There were 20,843 packages of herring inspected and of these 70 were found to be below quality. There were 319,541 boxes of smoked round herring inspected and of these 58 boxes were found to be below quality. There were 6,596 packages of alewives inspected and all found up to standard. There were 19,565 packages of oysters inspected and of these 16 were found to be below quality.

As well as carrying out the inspection of barrels and fish the inspecting officers as required by the Fish Inspection Act carried on the inspection of all fish-curing establishments with a view to seeing that such were kept in a proper sanitary condition.

#### *Pacific Coast*

On the Pacific coast the fishery officers who are qualified to do so carried on the inspection of dry salted herring. These are roughly salted and thrown into boxes, but while the actual salting and curing of the fish do not call for much skill, it is necessary for our officers to see that the fish have been in contact with salt for a sufficiently long time to preserve them and to prevent loss of weight and resultant disputes when their destination is reached on the Asiatic side of the Pacific. The box in which the herring are shipped is also being standardized and the officers are charged with seeing standard boxes only are used and that these are filled to capacity.

During the season 1934-35 there were inspected 107,567 boxes of dry salted herring.

#### INSPECTION OF CANNERIES AND CANNED FISH

The inspection of fish and shellfish canneries of all kinds on both coasts, the raw material used therein, the canning processes and the canned product was continued by the officers of the department during 1934-35.

This inspection is governed by the Meat and Canned Foods Act and a set of regulations under the authority of that act. It has for its object:

- (a) The extension of trade by improving the quality of the product.
- (b) The protection of the public by preventing the packing of unsound fish and insisting on the correct labelling of the cans.

During the season under review there were operated in the provinces of Nova Scotia, New Brunswick, Prince Edward Island, British Columbia and in the Magdalen Islands 305 lobster canneries, 50 salmon canneries, 12 clam canneries and 15 other canneries in which were canned sardines, shrimps, crabs and other fish.

The grading scheme for standardizing lobster canneries on the Atlantic coast, which was described in previous annual reports, continues to bring about improvement in the construction and equipment of such places and the sanitary conditions under which lobsters are canned. The inspecting officers give particular attention to testing the weights of lobster meat packed in the various sized cans at each cannery throughout the season.

A special inspection of canned salmon is conducted on the Pacific coast. This was begun in the year 1932 and described in previous reports. It may be again noted that the inspection provides:

- (a) That no canned salmon is to be shipped out of the province without inspection.
- (b) That parcels of canned salmon found to be fresh, firm and well packed are granted an official certificate of approval.
- (c) That parcels of canned salmon found to be sound and fit for human food but not quite up to the standard required for a certificate are classed as "second quality."
- (d) That parcels falling below second quality are confiscated and destroyed or used by the department for purposes other than human food.

Under this inspection since April 1, 1934, to March 31, 1935, there were inspected 1,550,700 cases. Of that quantity, 1,521,751 cases were found to be entitled to the certificate of approval as provided by the regulation and 28,949 cases were found to fall below the standard required for certificate. All of the quantity falling below the certificated standard, 26,017 cases, was graded as second quality. These were mostly of the sockeye species. One thousand one hundred and fifty-two cases were found to be below the grade for second quality and were consequently destroyed. Included in the total inspections were 1,780 cases of what are known as "tips and tails." For these no certificate is issued.

#### INSTRUCTION IN FISH CURING

During the fishing season of 1934 the department continued to give instruction to fishermen on certain parts of the Atlantic coast in the Gaspe style of curing cod, and in other sections, instruction in the curing of cod in pickle and the making of boneless fish.

*Gaspe Cod Curing.*—As in previous years two qualified instructors were employed for this work, one was placed at the Magdalen Islands and the other in the county of Gloucester, New Brunswick. At the Magdalen Islands instruction was begun in the middle of May and continued until the first week in December. In Gloucester county, New Brunswick, instruction was begun in the end of May and continued to the end of November.

The two instructors continued to use the same methods as in previous years, namely, visiting the landing places on the arrival of the fishing boats each day and giving instruction in the splitting, washing and salting of the fish. Afterwards, when the drying stage was reached, they visited the drying places, giving instruction in and supervising the methods of drying.

The fishing points visited regularly at the Magdalen Islands were Aurigny, Premiere Etang, Basin Cove, Etang du Nord, Cabin Cove, Hospital Cove, Pointe Basse, Grindstone, Belle Anse, Grand Entry, Grosse Isle, Brion Island, West Cape, Point du Loup, Amherst Harbour, Old Harry's Cove and Big Cape.



The fishing places visited regularly in Gloucester county were Savoy Landing, Shippegan Island, Cape Bateau, Coteau Road, Upper Lameque, Island River, Pigeon Hill, Little Shippegan, Miscou Harbour, Miscou Centre, Wilson's Point, Grand Plaines, Point Alexander, St. Cecile and Point Canot.

The instructors kept in close touch with the regular fishery officers of the department in the districts where they were working.

*Cod Curing in Pickle.*—Instruction in the curing of cod in pickle was continued in Nova Scotia and Prince Edward Island during 1934. It was again under the immediate direction and supervision of Mr. George R. Earl. He had assisting him four highly qualified men who were able to demonstrate the actual splitting and salting of the fish and the cutting of it into boneless.

This work was again extended to a number of additional points on the mainland of Nova Scotia east of Halifax and in Cape Breton Island. Instruction was extended to such places as Savage Harbour, Mount Stewart and the Souris district in Prince Edward Island.

The department has been assured that in all places where fish were prepared under supervision of and in accordance with the instructions given by our instructors there was an advance of thirty per cent in price to fishermen. As a result of the instruction thus given the price for pickle cured cod when bought for export in eastern Nova Scotia is now on a par with the price in western Nova Scotia.

There is evidence of a call for the extension of this instruction to western Nova Scotia. Several enquiries have been made by some large firms for assistance particularly in the manufacturing of boneless and packaged fish. It is, therefore, expected that in the course of the fishing season of 1935 that part of the province of Nova Scotia will be given attention by Mr. Earl and his assistants.

#### EDUCATIONAL COURSES OF INSTRUCTION

Under an arrangement with the Biological Board of Canada a course of instruction to fishermen was given at the Fisheries Experimental Station at Halifax, Nova Scotia, in the beginning of January, 1935. As the board was unable to provide funds for a course of six weeks as had been given in previous years, it was compelled to restrict the length of the course this year to three weeks and to limit the number of fishermen to twenty.

The instruction given at this course was largely along the lines of that given in previous years. The fishermen were shown how to prepare and pack pickled fish such as mackerel, herring, etc. Instruction was also given in barrel making. The fishermen were also taught how to cure cod in pickle and to produce therefrom high grade boneless fish. Instruction was also given in the operation of motor engines, also in navigation. Instruction was given the fishermen in elementary science bearing on fish life and the care and preservation of fish.

At the same time a course of instruction was given to certain fishery officers who were required to qualify as grade two inspectors for the inspection of fish.

The staff of the Experimental Station at Prince Rupert continued the series of lectures to fishermen. This was chiefly concerned with the care and preservation of halibut at sea and the construction of fish holds in the vessels in such a way as to insure fish being landed in the very best condition.

It is proposed to extend this work to fishermen in the southern part of the province by means of lectures at certain points.

## APPENDIX NO. 5.

### ENGINEERING BRANCH

REPORT BY CHARLES BRUCE, A.M.E.I.C., FISHERIES ENGINEER

Works of a technical nature, conducted by the Engineering Branch, are confined to those in the Maritime Provinces and British Columbia in which the Federal Government administers the fisheries. In addition to the works undertaken directly by the department, these include the services of the branch in assisting and co-operating with fish and game associations by advising, conducting surveys and providing designs for the establishment of hatcheries and rearing ponds; the design and supervision of construction of bait freezers built by fishermen's associations; the design and supervision of construction of fishways built by the owners of dams; and the supervision of the leasing of areas for oyster culture in Prince Edward Island which comes under departmental administration.

Where obstructions to the ascent of fish, due to accumulations of debris and trees, brought down by freshets, occur in smaller streams it is the usual practice to require the fishery inspector to investigate the conditions and provided action is necessary the work is performed under his supervision. In British Columbia two departmental patrol boats were equipped with tools so that the crews of such boats could deal with minor obstructions and thus obviate the need for employing additional labour.

All work of the branch in British Columbia is under the direct supervision of Resident Engineer John McHugh, with headquarters at Vancouver.

### BUILDING FISHWAYS AND CLEARING RIVERS

#### NOVA SCOTIA

*Tusket River, Yarmouth County.*—The situation with respect to the ascent of salmon past the dam of the large power development near the mouth of this river continued to engage attention. Notwithstanding considerable work of improvement of the channel below the dam the previous year, the early run fish did not ascend in any numbers although there is no apparent reason for their not doing so as gaspereaux find no difficulty in ascending in immense numbers.

The matter has been referred to the Biological Board for investigation as to the possibility that reasons other than those relating to the facilities for ascent may be responsible for salmon remaining in the estuarial waters below the dam.

After the freshet is past in the early summer it has been the practice to vent all the water possible through this fishway and to supplement it with a quantity through one of the waste gates in order to afford sufficient in the river bed below to induce salmon to ascend. This arrangement has not proved entirely satisfactory as not only was the supplementary supply liable to considerable variation but it was felt that it tended to attract salmon away from the fishway entrance. To overcome this it was decided to enlarge the inlet of the fishway and raise the side walls so that sufficient water could be taken through it to supply the necessary quantity on the river bed below without resorting to the supplementary supply from the gate. This work was completed late in the season last year.

A design was prepared for a fishway utilizing one of the gate openings in the storage dam at the foot of Carleton lake. Fish have no difficulty in getting past this dam when there is a spill but after the storage has been drawn off they are unable to do so and the fishway is designed to overcome this. The question of proceeding with this construction is still under consideration.



The Millar-Gordon Company built a fishway in a small storage dam at the foot of lake Fanning, utilizing the log sluice in which a series of baffles were installed to regulate the flow and afford a passage for fish.

*Roseway River, Shelburne County.*—Since provision was made several years ago for the ascent of fish past an unused dam at the mouth of this river there is evidence that salmon are resorting to the stream. A fishway was built by the owners of the "Jones" dam about twelve miles up the river, from designs furnished them and some small repairs were made to that in the "Andrew Bower" dam. A specification for a rack to prevent the ascent of salmon into the tailrace canal of the Nova Scotia Power Commission's hydro electric plant was prepared and notice served on the commission to install it during the coming year. In addition to this considerable work was proposed to improve conditions for the ascent of salmon during low water in the river channel between the tailrace and the foot of the dam. High water prevented the execution of more than a small part of this work, and it is proposed to continue it during the coming summer.

*Mersey River, Liverpool County.*—The possibilities of providing artificial spawning areas by placing gravel at suitable places in the river bed below No. 3 Power Development were investigated. It was not deemed advisable to embark on any program until the value of such work is definitely determined.

Several small experimental spawning beds were placed and will be examined at intervals during the winter to ascertain to what extent salmon used them and how the eggs survived.

*Medway River, Queens County.*—Repairs were completed on one wall of the fishway in the dam at Salters falls, which had cracked from ice pressure during the extreme winter of last year.

*LaHave River, Lunenburg County.*—Work to complete modifications to the fishway in the Wentzell dam was undertaken but high water again prevented the execution of a portion of the work at the lower end which will be undertaken during the coming summer.

*East River, Lunenburg County.*—Data was obtained and information supplied to the Nova Scotia Light and Power Company, for repairs and modifications to the fishway in their dam on this river, which were made necessary owing to the fact that an extreme freshet had entirely altered the contour of the river banks and undermined the fishway.

*Petite Riviere, Lunenburg County.*—A section of the river bed some 200 feet long where conditions were not favourable for the ascent of salmon during low water, was channelled by removing boulders and piling them along the river bank. Some blasting was involved in the removal of heavy stone.

*Whites Lake, Halifax County.*—Over one-half a mile of the stream flowing from this lake channelled by blasting and removing boulders to facilitate the ascent of sea trout, which investigation showed, were being held up and were liable to destruction from both stranding and poaching.

*Porters Lake, Halifax County.*—A channel was excavated through the beach to permit the entrance of fish into the lake. Heavy storms close the natural channel to such an extent that fish cannot enter.

At the following locations obstructions, consisting of debris, old trees, etc., which had been carried down by freshets and which, investigations by the fishery inspectors revealed, would prevent the free passage of fish, were removed:—

One Mile river, Halifax county (old dam).

Osier river, Halifax county.

Gaspereau brook, Antigonish county.

Trout brook (Mira river), Cape Breton county.



Benacadie river, Cape Breton county.  
Gaspereau river, Cape Breton county.  
Salmon river, Cape Breton county.  
Lily pond to Mira river, Cape Breton county.  
McInnis brook, Inverness county.  
Trout brook, Inverness county.  
Rosseau Du Lac brook, Inverness county.  
Little river, Inverness county.  
McKenzie brook Iron Mines, Inverness county.  
Lake O'Law brook, Inverness county.  
Margaree river, Inverness county.  
Captain Allan's brook, Inverness county.  
Chisholm's brook, Inverness county.  
Big brook, Inverness county.  
Kennedy brook, Inverness county.  
Alder brook, Inverness county.

#### NEW BRUNSWICK

*Magaquadavic river, Charlotte County.*—A land slide in the gorge in which the fishway at St. George on this river is located, resulted in immense quantities of rock being deposited in the fishway and at one point pressure of the overburden caused a break in the concrete wall. It was necessary to remove the material and repair the break.

Since salmon have been ascending this river the problem of providing a means for their descent other than through the turbines has arisen. Investigation was made and a specification prepared for a sluice immediately at one end of the trash racks at the intake and notice was served on the owners of the dam requiring its construction during the coming year.

*Nashwaak river, York County.*—Since the gates in the concrete dam at Marysville were removed several years ago it has been the practice each fall to install a wooden apron or sluice at the lower end of the gate opening to facilitate the ascent of salmon during the heavy run which occurs in September and October. While this provision was reasonably efficient, it was difficult to hold the apron in position should a heavy freshet occur and it was carried away on several occasions.

To overcome the difficulty and afford something of a permanent nature it was decided after investigation to build several concrete blocks on the floor of the gate opening and to extend this floor fifteen feet down stream with heavy boulders projecting above the surface placed in it at intervals. This was designed to retard the velocity of the flow and to form eddies which it was thought would afford resting places for ascending salmon. Reports after its completion indicate that all salmon succeeded in making the ascent with even less difficulty than under the previous arrangement.

*Chamcook lake, Charlotte County.*—A screen was placed at the outlet of the lake to prevent the descent of landlocked salmon into the outlet stream from which due to rapids they would not be able to return.

#### BRITISH COLUMBIA

*Takush River, Smiths Inlet.*—A log jam on this stream caused by erosion of the banks and the falling of large trees across the stream bed presented a barrier to ascending salmon particularly at low water. It was considered necessary to cut a channel thirty feet wide through the jam and to float the material thus disposed of out to salt water. The appropriation was insufficient to fully complete

this though a channel 20 feet wide was made, through which salmon passed safely. The local inspector now reports that in his opinion it is desirable that the cut be widened to the width originally suggested and an additional appropriation for this purpose is to be asked for. When this work has been done, it is expected that conditions in this stream will be quite satisfactory.

*Gull Chuck River, Bella Bella.*—A survey of the falls on this river showed them to be 75 feet in width with a drop of 10 feet in 25 feet. In the year 1923 considerable work was done on the falls, a fish pass being cut through the rock which permitted the easy passage of salmon. Due to erosion, however, the two upper steps with their corresponding pools have disappeared, causing the water to flow through this section of the fish pass with great velocity and thus rendering the passage one of great difficulty. As a result of the survey it has been decided to reconstruct the upper end of the fishway, and arrangements have been made to perform the work during the low water period in January, 1935.

*Lilian River, Deer Passage, Bella Bella.*—This is a coho stream also rendered difficult of passage because of natural falls having a total height of 12 or 13 feet. The fall, however, is not abrupt and can be more easily remedied than if it were so. A plan has been laid down whereby with some blasting to aid in the concentration of the water it is hoped to overcome the difficulty without undue expenditure of money. This work is likewise to be done during the low water period January, 1935.

*Maggie Lake, Alberni Canal, V.I.*—Rough levels were taken of the falls at Maggie lake for the purpose of being prepared to proceed with definite plans of improving the falls should there be any marked return of the sockeye which have been planted in this area. This is a most difficult situation because of the extremely rough and broken nature of the river bed in which the falls are located and the construction of a fish ladder here to overcome a height of at least 23 feet in a distance of approximately 130 feet will be a costly undertaking for which no definite figures have been prepared. Thus far, there has been practically no return of mature fish from the annual plantings of sockeye eggs, and until there is a satisfactory return it is not considered necessary to obtain further data with respect to this proposal.

*St. Andrews Creek, Sproat Lake, V.I.*—A log jam which had the effect of raising the water two feet in height behind the jam and thus presenting an absolute barrier to the ascent of fish at all but freshet periods was removed from the bed of the above mentioned stream thus enabling the coho salmon which frequent the stream to have access to the full extent of the spawning grounds.

*Canoe Pass Creek, Alberni District.*—This creek has been the subject of many inspections in the past owing to the collection of logging refuse left on the banks of the stream by defunct logging companies. Freshets in the fall of 1933 brought a great deal more of this material down stream where it lodged in the form of a jam of heavy logs blocking the stream and making it exceedingly difficult for fish to pass through. The jam was removed satisfactorily and the salmon enabled to reach the spawning grounds without difficulty.

*Moyeha River, Herbert Arm, Clayoquot Area, V.I.*—An obstruction existed in the above mentioned stream caused by a landslide, which occurred about a mile from tide water and precipitated large spruce and cedar trees some of them seven feet in diameter into the river where they floated down and lodged in the shallows holding up all other floating material, creating a jam unpassable for salmon, and closing off six miles of spawning beds. This jam was completely removed. Coho and chum salmon frequent this stream and are now able as a result of this work to proceed unhindered to their spawning grounds.



*Sproat Falls, Sproat River, V.I.*—An instrumental survey was made and plans were prepared covering a proposal to so improve the above mentioned falls that the sockeye salmon which spawn in the various streams draining into Sproat lake could ascend more easily to their spawning grounds. The falls consist of a series of ledges of smooth flat rock having a total height of thirteen feet in a river distance of eighty feet. There is great variation in the range of stream flow and at times progress over the falls is most difficult, causing bruising and injury to salmon ascending at these times. The estimated cost of this proposed work was placed at \$1,100 but funds available did not permit its performance this year. The records are available for action when conditions are more favourable.

*Quamichan River, V.I.*—The above river which drains a lake of the same name on Vancouver island has been given much thought during the past year. Trout fishing in the lake is reported to be much poorer than formerly and there has been considerable local agitation with a view to improving the falls which exist in the river and providing a fish ladder in a dam some distance upstream. Arrangements were completed to do this work but at the last moment certain objections were raised by the owners of the property through which the river flows. It was contended that coarse fish would on completion of the work have access to the lake and that the natural scenic values would suffer in consequence of the work done on the falls. Under the circumstances the work was not commenced and will be held in abeyance.

*Yakoun River, Q.C.I.*—A large jam which obstructed the passage of pink salmon was removed from this stream. This river flows through primeval forests containing enormous spruce trees and erosion occurs during freshets causing some of them to fall into the river and become the nucleus of log jams. It is found to be most economical to attend to such fallen trees as soon as possible after they have fallen rather than wait for accumulations that in the experience of the department in past years have cost large sums of money to remove. Hence, each year, there is a need for remedial work to be done on this stream.

*Silver Creek, Uchucklesit Harbour, V.I.*—An inspection was made of a supposed obstruction consisting of a collection of logs and trash about one-half mile from the mouth of the above stream. However, this was not considered to be a serious matter and no action was taken towards removal of the material as it was considered that there was great possibility of it being moved naturally during the winter freshets. Action will be taken at a later date should it be necessary.

*Marvin's Bay Creek, Nootka Sound, V.I.*—An inspection was made of a reported obstruction consisting of a log jam 15 feet high that has evidently been lodged across the channel for many years. Careful inspection revealed that underneath the jam, freshets have scoured the river bed on the right bank down to rock bottom and there was ample room for the passage of fish. Until conditions change very materially, it was recommended that no action be taken.

*Brothers Creek, Capilano River.*—A log jam consisting of logs, roots and debris, backed up by river gravel caused a fall seven feet high in this stream rendering the passage of salmon to the spawning grounds on this system quite impossible. The jam was removed and the stream bed restored to natural conditions after which the fish passed through without difficulty.

*Nanoose Creek, V.I.*—A log jam which completely closed this stream to the ascent of salmon was removed and the stream bed restored to natural condition.

*General.*—In addition to the foregoing the following streams were cleared of obstructions by the local guardians or by crews of patrol boats without any additional help being required, and where necessary, explosives were provided for



these works: Nanon River, Q.C.I.; Big Qualicum River, V.I.; Sandy Creek, V.I.; Goldstream, V.I.; Bughouse Creek, V.I.; Carriden Bay Creek, and Kynoch Creek.

Where logging operations have been conducted on salmon streams, such operations have been inspected from time to time and when debris has been allowed to fall into the stream beds, the operators have been required to move same. The following streams have been cleared under this heading without cost to the department during the present year: Hoeya Sound creek, Bear river, Robbers Nob creek, Cahill creek.

*Lac La Hache.*—An examination was made of lac La Hache and its outlet stream to the San Jose river which drains via Williams lake into the upper Fraser for the purpose of determining whether the irrigation dam at the outlet of the lake constitutes an effective barrier to the ascent of trout and whether means should be taken towards the installation of a fish ladder in the dam. Examination was also made of a fall in the San Jose river which it had been suggested should be improved to make it passable for trout. This fall was found to be 12 feet high and unquestionably a barrier to the ascent of fish. Additional information is to be provided by the local inspector during the coming spring at the time trout are moving in the stream and no definite program can be laid down until this additional information has been procured. This inspection also covered Timothy Mountain lake which drains into lac La Hache and is also used as a storage basin for irrigation water. Irrigation is such a vital question in this section of the country that the fullest data should be procured before anything is done that might adversely affect the production of agricultural products or the well-being of the ranchers.

*Knough, Devick and Community Lakes.*—These are three lakes with control dams at their outlets lying in the vicinity of Kamloops. Each is at the headwaters of an irrigation system, the intakes of which are situated below the dam. An engineer's report advising on the best method of screening these intakes was asked for and reports, plans and estimates were submitted on each project. The area in which these lakes are located is dry belt and it is only by irrigation that it is possible to raise crops of any kind, but with an adequate supply of water splendid crops are grown. The Fisheries Act provides for the proper screening of such project to prevent the loss of small fish (trout), which are known to get into the irrigation ditches where they become stranded and lost.

The screening of a head work requires that constant attention be given to it during certain periods when leaves and other vegetation are being carried down the stream. Otherwise the screens block and overflow and cause damage to headworks or else the water cannot find an exit until the reservoir builds up. In each case the result is the same. The farmer gets no water and his prospective crop is ruined. It is difficult to enforce the act in such cases and since most of the farmers concerned are unable to make more than a bare living from their labour, stringent enforcement of the act would only result in driving them off the land. The above three cases come under this category and definite action to enforce compliance is being withheld for the time being.

*Stamp Falls Fishway.*—Certain repairs covering the reconstruction of No. 5 wall of the Stamp Falls fishway and minor repairs to No. 6 wall together with the removal of slide rock from the various pools was performed during the year in time to accommodate the sockeye run. This fishway is now reported to be in excellent condition.

## FISH CULTURAL ESTABLISHMENTS

Work under this heading was confined principally to repairs and maintenance of existing buildings and equipment all of which were efficiently and economically performed. A classified description of the principal works performed is given hereunder.

## NOVA SCOTIA

*Bedford Hatchery.*—The bulkhead at the lower end of the canal from which the hatchery water supply is taken was renewed with concrete, to replace the wooden structure which had rotted out. Considerable repairs to the stone wall of the canal, which had fallen in, were completed.

*Stevens Brook Ponds.*—Due to leakage in the walls of the road culvert at the head of these ponds, which allowed considerable waste of water, it was necessary to install a corrugated galvanized iron pipe line under the road to safeguard the water supply to the ponds. The Provincial Department of Highways was approached but was not prepared to renew the culvert as it functioned satisfactorily in so far as drainage was concerned.

*Antigonish Hatchery.*—Owing to extreme drought it was necessary to lower the outlet of South River lake to afford sufficient water for hatchery operations during the summer months. In order to safeguard the water supply investigation was made with a view to providing storage. The possibilities at both South River and Giants lakes were investigated and plans prepared for the installation of control gates at the outlet of the former lake.

Considerable repairs were made to the concrete water supply dam on South river, as well as to one wall of the fishway. This involved the construction of a temporary dam as it was not feasible to lower the water with the large numbers of fish held in the rearing ponds.

Two new circular ponds, each measuring twenty-seven feet in diameter, with the requisite water supplies, were constructed, and repairs to the concrete walls of the rearing pond system were completed.

A store room measuring 20 feet by 24 feet, one storey high, was built at the rear of the garage.

*Nictaux Falls Salmon Pond.*—Four rearing troughs, each measuring 18 inches by 2 feet by 16 feet long, were built and set up, with the necessary water supply, to supplement the system of twenty rearing troughs previously operated at this point.

*Lindloff Hatchery.*—The water supply dam, which was an abandoned mill dam, had been giving trouble for several years and examination showed that its condition was such that renewal would be necessary. As it was desired to provide some space for rearing ponds, which could not be obtained elsewhere on the site, it was decided to abandon this dam and utilize the area submerged by it for ponds. As this dam was only a short distance below the foot of Lindloff lake it was a comparatively small matter to install a control gate whereby the lake waters were not only retained at the necessary elevation, but could be regulated to provide some storage. Investigation showed that the space made available would provide for eight circular rearing ponds each thirty feet in diameter, and four of them were built. The water supply for these ponds, the hatchery and two earthen ponds was provided by building a wooden flume, from the lake, outlets from which are taken off for each unit.

*Margaree Hatchery.*—The large fingerling pond at the lower end of Series 30 was cribbed along the north side, filling in the low swampy ground, and a



dam and screen were installed at the head where the pond narrows. A better flow of water is thereby obtained which not only facilitates cleaning but improves the general appearance.

Pond Series 31 was improved by installing fine non-flooding screens to replace earthen dams. This has permitted of taking ample water through the series during dry periods which could not be done with the previous arrangement.

#### NEW BRUNSWICK

*Florenceville Hatchery.*—An addition was built to the dwelling twelve feet wide, twenty-four feet long and one and one-half stories high, providing a dining room, store room and two additional bedrooms.

A new septic tank was installed with the necessary rearrangement of the sewer to make connections.

Two large earthen ponds were converted into circular ponds, each having a diameter of slightly more than fifty feet. The necessary drain pipes and screens were installed and a water supply arranged from the overflow of the concrete pond system.

Repairs were made to one wall of the concrete pond system which had cracked.

*Grand Falls Hatchery.*—The five wooden rearing ponds, each measuring 76 feet long, 4 feet wide, 2 feet deep, which were built at this hatchery in 1921, were found on examination to be rotted beyond repair. These ponds were entirely rebuilt and two additional ponds of the same dimensions were added to the system, making a total of seven.

Some experimental work was done to test the feasibility of circular ponds. The soil is porous and it was difficult to obtain suitable clay in the vicinity for lining purposes. Further work in this regard is being undertaken.

*Restigouche Hatchery.*—Repairs to the water supply dam, including the gate and apron were effected and the centre sill of the hatchery was blocked up to afford stability to the building which is in very poor condition generally.

*Bartibog Salmon Pond.*—Following the decision by the department to erect a salmon retaining pond in the mouth of the Bartibog river for early run fish, arrangements were made and a pound net forty-five feet long, twenty feet wide and ten feet deep set, after the necessary piles had been driven. In order to protect the impounded salmon from seals it was necessary to provide heavy wire netting which was hung around the enclosure outside the piles.

#### BRITISH COLUMBIA

*Rivers Inlet Hatchery.*—Certain repairs embracing the complete renewal of approximately one-third of the floor of the above hatchery were completed during the year. Both sills, joists and flooring of the central third of the building were completely removed and replaced with new material. The building is now in good condition.

*Skeena River Hatchery.*—An additional emergency water supply was furnished to this hatchery by tapping the spring which furnishes domestic water and piping it into the hatchery building for use should the main supply fail for any reason.

*Cowichan Lake Hatchery.*—A set of retaining pens was constructed in the Cowichan river for use in connection with the early feeding and development of Brown trout and Atlantic salmon reared in the above-mentioned establishment.



These pens constructed to float in the river so that the natural food carried in the stream could be utilized by the young fish inside them, were of frame construction with wire mesh sides or walls; the pens were suspended from a floating framework of logs which could be moored where desired.

*Cultus Lake Hatchery.*—A special visit was made to this establishment for the purpose of seeing to the proper installation of a boom by the Cultus Lake Parks Board at the foot of the lake to prevent drift material in the lake from entering the outlet stream and fouling the fences located in this stream for the use in the investigation being conducted by the Biological Board.

*Pitt Lake Hatchery.*—An examination was made of the Pitt Lake Hatchery building for the purpose of arranging for necessary repairs to the foundations which are showing signs of rot and arrangements were made to procure the material necessary to complete the work during the coming year.

All arrangements have been made for getting out the logs necessary for this work and the actual repairs will be commenced just as soon as the contents of the hatchery have been liberated in the early months of 1935.

*Harrison Lake Hatchery.*—It was considered that an engineer's opinion should be given in the matter of water supply to the Harrison Lake hatchery which is again being operated this season. The water supply to this establishment is procured under agreement from a hydro-electric line operated under a very high head of the Hotsprings Hotel Company. The pipeline was reported to be in bad condition by the officer in charge of the hatchery and a bad break would imperil the contents of the hatchery. After a detailed examination of the entire pipeline a report was submitted stating that whilst the ordinary hazard in connection with such things was ever present, yet the situation was of such vital importance to the hotel company that, even if a break did occur, no time would be lost by the company in making repairs. The situation is being carefully watched, however, and the proper action will be taken immediately should necessity arise.

*Beaver Lake.*—Beaver Lake lies at an elevation of 5,000 feet and is in the vicinity of Kelowna, B.C. The lake was stocked with Kamloops trout some years ago, results from which have been so successful that a supply of trout eggs is now available each year for outside distribution. In order to determine the best method of fencing this stream so that parent trout could be captured on their downstream migration it was necessary for an engineer to make a survey and prepare plans for a suitable spawning fence. This was done and whilst the fence has not yet been constructed it can be any time during the low water period at very short notice.

*Lardeau Eyeing Station.*—After operating for one season it was found that owing to an unsatisfactory water supply it was quite impossible to carry on the work here with satisfactory results and operations were transferred to Argenta creek which drains into Kootenay lake almost opposite Lardeau. This location, together with the supply of water from Argenta creek would appear to meet requirements better. A survey of the property available for this purpose was made and negotiations are at present being conducted with the owner of the proposed site with a view to transferring these operations permanently to Argenta creek.

## CO-OPERATIVE FISH CULTURE

### NOVA SCOTIA

*Butler's Brook, Lunenburg County.*—At the request of Dr. A. C. Fales, representing the Nova Scotia Fish and Game Protective Association, a survey was conducted at Butler's brook, Nine Mile lake, to determine the feasibility of establishing a small system of rearing ponds. Designs of such a system were subsequently prepared and furnished to the association.

## BRITISH COLUMBIA

*Veitch Creek Hatchery, V.I. (Provincial Government).*—The annual report for the year 1933 made reference to a survey and the preparation of plans for the construction of a trout hatchery at this point. This resulted in the construction of the plant in the early months of 1934 by the British Columbia Game Board. The plant is practically a duplicate of that constructed at Stanley park, Vancouver, in the previous year and consists of a hatchery building 50 feet by 20 feet and sixteen outside retaining tanks each 16 feet by 3 feet by 3 feet. The work was completed in time for the accommodation of the early spring trout eggs.

*Kelowna Rearing Ponds.*—These ponds are located on a site purchased by the British Columbia Game Board in the previous year. The ponds consists of natural depressions in a piece of ground of very irregular contour in the vicinity of Kelowna, B.C. The services of this branch were requested to make an instrumental survey of the layout and to draft a program whereby complete control of the water supply could be obtained so that the ponds could be regulated to any desired level and drained as required. The survey was completed and plans prepared and forwarded to the department. Since then the work has been put in hand and now stands partially completed at the expense of the Kelowna Rod and Game Club.

*Rearing Ponds, Vernon.*—A site for trout rearing ponds in the vicinity of Vernon to be constructed and operated by the local fish and game club was examined and reported on. It is understood this pond has since been completed.

*Rearing Ponds, Princeton.*—An instrumental survey of a trout rearing pond about  $4\frac{1}{2}$  acres in extent in the vicinity of Princeton was made and reported on. This pond has been operated by the local fish and game club and as a result of stocking by this department was shown capable of producing very fine trout. The survey was required in connection with proposals for further improvements in the situation.

## BAIT FREEZERS

*Petit de Grat, N.S.*—After the department had entered into an agreement with the organized fishermen of Petit de Grat for the erection of a twenty-ton cold storage and bine freezer for bait, designs for this plant prepared in the department, which included three cold storage rooms, an ice house and a freezing room. The brine-freezing equipment was designed in collaboration with the Fisheries Experimental Station at Halifax where, as a result of experimentation, it had been determined that not only was efficiency in freezing increased by the use of what was termed the "barrel system" as compared with the tank previously used, but the process was simplified. Steel barrels for containers in which to freeze the fish, from which the system was named, were replaced by rectangular wooden compartments in the construction as not only did the use of wood result in less refrigeration losses, but the rectangular tanks were more adaptable for freezing fish in different forms.

The work was completed by the fishermen's organization under supervision of the Engineering Branch which also supplied the services of a building foreman.

## LEASING OF OYSTER AREAS

During the year under review the leasing of unproductive oyster bottom in suitable places in Prince Edward Island was continued. Thirty-one leases were completed making a total, with those issued in the previous years since leasing started in 1932, of seventy-nine, and comprising 343.56 acres. In addition to completed leases there were 110 applications before the department. Of the



completed leases 60 are in Malpeque bay, 4 in Foxley river, 8 in Brackley bay, 1 in Covehead bay, 2 in Pinette river, 1 in Rustico bay, and 3 in Savage harbour.

A detailed report of oyster cultural work by the department will be found in Appendix No. 6.

#### MISCELLANEOUS

*Fisheries Station, Schooner Passage Rivers Inlet.*—A report on the water supply at this station was prepared in which were submitted certain recommendations for renewal of the pipeline which owing to damage by frost was not capable of rendering suitable service. This matter has been referred to the Public Works Department, which constructed the station originally.

*Fisheries Station, Poplar Island—Fraser River.*—The traffic bridge which connects Poplar island with the mainland has been condemned by the Public Works Department and it would appear that there is not much likelihood of its being replaced. Besides traffic this bridge carries the light and power and water services to Marine Ways operated by the department on Poplar island. As the bridge is now safe only for foot-passenger traffic, it has been recommended by the Public Works Department that a new site for the plant be found on the mainland to obviate the necessity of rebuilding it. A site has been found on the North arm of the Fraser river within the limits of the city of New Westminster and plans of the proposed layout have been prepared together with estimates and submitted to the department for its consideration.

*Trap Sites, Boundary Bay.*—It was suggested during the trap-fishing season that one of the United States traps operating in Boundary bay was partially infringing on Canadian territory, and this branch was called upon to determine definitely if this was the case. After the line of the international boundary was established it was found that whilst the trap was built up to it none of it projected over on to Canadian territory.

*Pollution—Woods and Kalamalka Lakes, Okanagan.*—During a particularly hot spell of weather in July a very heavy unaccountable loss of native fish (Rocky Mountain whitefish) occurred in Woods lake and the shores of the lake were strewn with dead fish in great numbers. Woods lake is connected with Kalamalka lake by a canal about 50 feet wide and 300 feet long, through which fish can pass. Kalamalka lake is the source of the domestic water supply for the city of Vernon and fears were entertained that should the epidemic spread to Kalamalka lake, the water might become infected and be harmful to the residents of the city. The department's engineer was called in to advise with respect to a suggestion that the canal be temporarily closed to prevent the contamination suggested. Fortunately, however, colder weather intervened and with it a cessation of mortality with regard to the fish. Fears subsided with the return of normal conditions and no further action was required.

*Fishing Boundary Signs, Qualicum Rivers.*—Three fishing boundary signs consisting of concrete anchors weighing 400 pounds each and connected by wire rope and swivel shackles to wooden floats on which were fastened standard triangular boundary signs, were constructed and established at the mouths of the above rivers on the east coast of Vancouver island.

This coast is very exposed and substantial construction is necessary here in order that the signs may remain in position.



## APPENDIX NO. 6.

### REPORT ON OYSTER CULTURE

#### OYSTER CULTURAL WORK BY THE DEPARTMENT OF FISHERIES, 1934-35

BY DR. A. W. H. NEEDLER, BIOLOGICAL BOARD OF CANADA

The Dominion Government, by an agreement with the province of Prince Edward Island in 1928, obtained jurisdiction over the oyster areas of the province and undertook to develop its oyster industry. As the most important step in that direction the establishment of oyster farming was planned in those suitable areas which did not support a valuable public fishery. The most important of these was the Malpeque Bay area which once supported the largest fishery in the province but in which the oyster stocks had been reduced to a low level by intensive fishing and then almost completely obliterated by a disease in the years following 1914. Operations were concentrated in this area, which has similar conditions to those in other areas along the north shore of the province.

The presence of oysters in small but increasing quantities at the heads of the inlets tributary to Malpeque bay had indicated that oyster farming might again be feasible in the area. In 1928 and 1929 the area was explored by the department and experimental plots were established on which the success of certain oyster cultural methods was to be demonstrated or determined. The department obtained the services of a practical oyster farmer from New England who applied methods known to him, using as a basis both locally produced "seed" oysters and oysters transferred from other areas in the province. In 1929 the Biological Board of Canada commenced scientific investigations relative to oyster culture making its headquarters on Bideford river, one of the inlets tributary to Malpeque bay. In 1930 the experimental work of the department was placed under the supervision of the writer who was in charge of the board's oyster investigations.

It was found that oysters introduced from other areas died in about a year with symptoms similar to those of the disease of 1914-16, while local oysters were unaffected, being apparently resistant. To prevent further damage by the disease the transfer of oysters to and from the affected area was prohibited, and it was necessary to depend on the local stock to establish oyster culture. The stock was limited largely to the heads of the inlets or "rivers" and to a narrow shore zone, i.e. to places where the greater summer warming of the water favoured reproduction and where wave wash kept the bottom clean. Deeper grounds were practically barren and, in the rivers, badly silted. The dependence of the industry on the very limited local stock emphasized the importance of conserving the stock for use in establishing oyster farming and of developing the best possible cultural methods. The area was kept closed to public fishing and the experimental farming, now concentrated in Bideford river, was continued.

In 1931, when the results of experimental farming were considered sufficiently promising to warrant encouraging private oyster farming, oyster ground in the Malpeque Bay area and in certain other bays having similar conditions was offered for lease. (A survey to facilitate the location of the areas had been made in 1929 and 1930.) Areas at the heads of the inlets, where reproduction is good but the quality of the oysters poor, were reserved for spat collection by all, and the department reserved areas in Bideford river for the continuance of experimental farming. These areas were also used for the production of stock to be sold to lessees to establish oyster culture in their areas.

*Leasing and Development of the Leased Areas.*—A number of applications were received immediately following the offer of oyster ground for lease in October, 1931. Investigation of the applications preceding approval, surveying and marking of the areas, and execution of the leases prevented the completion of any leases before 1932. To avoid unnecessary delay of the development of the grounds leased, work was permitted in a number of cases in advance of the completion of the leases, at the risk of the applicants. This policy has been continued and as a result there have always been a few areas on which work has been done but for which the leases have not then been issued. These areas are included in the accompanying table (below) which summarizes the development of leased areas.

The increased activity in the cultivation of the leased areas is shown in the table. As a large proportion of the lessees have been engaged in oyster farming for two years or less, many are conducting work only on a small experimental scale. But the degree of success attained is encouraging further efforts, as is indicated by the new areas being leased and increases in the development work being done.

The spread of oyster culture to more areas is indicated in the table, development work first appearing in 1934 in Rustico and Tracadie bays. There are, in addition, areas being leased in Pinette river and applications for leases have been approved in New London bay and in Conway inlet, but no actual development has yet been commenced in these areas.

The bona fide attempt of the lessees to establish their oyster farms properly is shown by the small quantities of oysters marketed as compared with the quantities of oysters and of spat and cultch planted. In numerous cases large quantities of oysters are available for sale but have been left on the grounds to promote further reproduction. It is clearly shown that the lessees are planning for development in the future. Great care is being taken not to jeopardize the breeding stock.

TABLE SUMMARIZING THE DEVELOPMENT OF LEASED AREAS

Region	Year	Number of Areas under Cultivation	Approx. Total Areas (acres)	Oysters Planted (bbls.)	Oysters Sold (bbls.)	Shell Cultch (bu.)	Cardboard Collectors (Number)
Malpeque.....	1932	26	110	254	none†	1,500	none
	1933	45	195	593	42†	1,600	none
	1934	81	367	1,093	335½†	1,000	1,190
Cacumpeque.....	1933	2	8	17	none	none	none
	1934	4	20½	423	33	50	64
Covehead..... (Brackley)	1933	6	33	370	50†	300	none
	1934	8	44	298*	92†	2,500	none
Savage.....	1933	3	8	58	none	100	none
	1934	3	8	82	none	150	none
Rustico.....	1934	1	5½	100*	none	none	none
Tracadie.....	1934	1	5½	50*	none	none	none
Total.....	1932	26	110	254	none	1,500	none
	1933	56	244	1,038	92	2,000	none
	1934	98	451	1,946	460½	3,700	1,254

\*Possibly not complete.

†Not including the yield of the old deeded area of G. S. Sharp et al. from which 65 bbls. were sold in 1934.

‡Not including oysters planted for part of the season only and taken up again for market, amounting in 1934 to about 600 bbls.

The table does not include any estimate of a number of other forms of development work, such as cleaning of mussels and silt from the areas, hardening of bottoms, separation of clusters, etc., it being obviously extremely difficult



to reduce such activities to figures. Such work has, however, involved a great deal of effort on the part of the lessees and has provided employment, which is increasing each year.

There has been some tendency, especially in the Malpeque Bay area, where the department carries on experimental farming, to turn from the method of obtaining spat on shells and planting them on the beds at an early age to other methods which lessen the losses from starfish in the young stages. These have included leaving shell cultch in safe situations until the spat is about a year old or more, and the collection of spat on concrete-coated cardboard "egg-crate fillers" from which separate spat are obtained for rearing on trays out of reach of starfish. The latter method is mentioned below. These developments are due to serious damage by starfish, which is limited chiefly to the first year of the oyster's life.

In the Malpeque Bay area where dependence for development must be placed on a limited local stock the latter occurs chiefly or almost entirely at the heads of the inlets and along the shore in shallow water for some distance seaward; i.e., in situations where high summer temperatures favour reproduction and where wave wash keeps the bottom clean. In the shallow shore zone winter mortality is high and tends to increase with the age of the oysters. To make use of the natural reproduction in these situations it has been the policy of the department to issue permits to lessees, and to applicants whose applications have been approved, to pick oysters for planting on their areas. Hand picking alone has been permitted, by which the taking of oysters is limited to shallow water where the mortality is high. This policy has led to the planting of large quantities of oysters from the shallow water into deeper water, by which they have been saved from the winter killing which would have destroyed a large proportion. Although there may have been some abuse of this privilege in a very few instances, the oysters have been used in a bona fide manner for stocking purposes. This is clearly shown by comparing the quantities picked and planted with those taken from the leased areas for market. In 1934, 978 barrels were picked and planted in the Malpeque Bay area and only 335½ barrels marketed from the leased areas. The latter quantity is much more than accounted for by the 847 barrels planted in the two preceding years.

*Experimental Farming by the Department of Fisheries.*—Experimental farming on areas reserved for that purpose in Bideford river (tributary to Malpeque bay) has had as its aim the development of oyster cultural methods suitable to our conditions, their demonstration to the industry, and the provision of stock for the establishment of oyster farming in other parts of the Malpeque and Cascumpeque Bay areas.

*Sale of Small Oysters to Lessees.*—In 1934, 233 barrels of oysters were sold to lessees for stocking purposes from the department's areas. These consisted almost entirely of oysters below marketable size, cleaned and separated as far as possible without damage, while a few large oysters of very poor shape were sold to serve as spawners. A demand existed for a considerably larger quantity. The price charged was \$2 per barrel at which the oysters represented a very profitable investment, thus encouraging the stocking of the leased ground. As the time is now approaching when some of the lessees, especially those towards the heads of the inlets, will be in a position to sell small oysters for stocking purposes, it is proposed to raise the price to \$2.50. The department does not want to keep the price too low to give a profitable margin for such sales.

*Sale of Marketable Oysters.*—In 1934, 421·9 barrels of oysters were marketed from the department's areas of which 251·6 were of ordinary quality (\$4 per barrel), 105·4 were of somewhat better quality (\$5 per barrel) and 64·9 barrels were select (\$8 per barrel). Both the quantity and the proportion of the higher grades were above those of 1933 when 327 barrels were marketed.



**Sale of Spat on Cardboard Collectors.**—Owing to an unusually heavy “set” a larger quantity of spat on concrete-coated cardboard collectors was obtained than could be handled to best advantage in the next season. The collectors bearing spat were offered for sale to lessees at fifteen cents apiece, which was considered to cover the cost of production. About a thousand spat could be separated from each collector (an egg crate filler) to be reared on trays (*see below*) or in some similar way. About 722 were purchased by the lessees of nineteen areas. In this way a new method of obtaining “seed” stock is introduced to the industry and the department provided stock to the lessees in another form. In the production of small oysters by rearing separated spat on trays the collection of the spat involves a great deal of care and experience while the subsequent separation and rearing involves most of the labour and expense. It is proposed to make a practice of the sale of collectors bearing spat until such time as it would interfere with private production for sale.

**Collection of Spat.**—Experiments towards the development of methods of spat collection included several aspects. The year 1934 was an unusually successful year in the collection of spat, although good quantities have been obtained in the department’s areas every year since 1929. Results from the use of floats to expose shells in wire bags were improved by lashing poles across the floats in pairs, the increased stability reducing the losses of bags in heavy storms to negligible quantities. Concrete-coated egg crate fillers were exposed by two methods—suspended from floats wrapped tightly with wire netting in bundles of four (the best method of 1933) and placed in floating trays with wire netting bottoms and wooden covers. Both methods gave such good protection as to reduce losses to negligible quantities, a considerable improvement over a number of methods tried in 1933. The heavy “set” obtained in 1934 so closed the openings as the spat grew on the edges of the cardboard that the inner spat grew poorly, and this effect was most noticeable in the floating trays in which the circulation was poorer than with the other method. Lighter “sets” lead to better and more uniform growth so that the total result is almost as good. Tiles coated with concrete were given further trials suspended from floats and staging, the results being encouraging but the details of the method susceptible of improvement. The successful collection of spat each year since the department started its operations in Bideford river is highly encouraging and, although the methods can be improved, shows the possibility of greatly enlarging the production when the resources are properly exploited.

**Rearing of Separated Spat on Trays.**—The results of oyster cultural operations in Bideford river have shown that the greatest problem is to rear the oysters from the time of their settling as spat to a size of one and a half to two inches, *i.e.*, to the end of their second summer. Even in the highly successful experiment on the Totten bed, in which a planting of spat on shells yielded 400 barrels from one-third of an acre in four years, the loss of spat in the first year exceeded 75 per cent and the usual loss is much greater, except perhaps at the heads of the creeks where starfish are not present. The latter constitute the greatest obstacle to successful oyster culture in the Malpeque bay and in many other areas. Following earlier experiments on a smaller scale about 175,000 separated spat were reared on wire cloth trays in 1934. The success of the earlier trials was confirmed and the production at an economical cost of single oysters large enough to escape serious damage when planted was accomplished. In addition to avoiding the high mortality, the method produces single oysters making unnecessary the separation of clusters and leading to the production of a good shape. It is particularly suitable for use by lessees of areas well down the inlets where oysters of high quality are produced but where local reproduction is poor.

*Transfer of Small Oysters from Shallow Shores at Enmore, P.E.I.*—In Enmore and Percival rivers in 1934 a great abundance of small oysters, chiefly from spatting in 1933, were present along the shores near low tide level. At the same time there was an almost complete absence of oysters in deeper water. It was felt that in these special circumstances it was necessary to save the small oysters by removal to deeper water in order to maintain any considerable stock of oysters in the area at all. At a cost of fifty cents per barrel 300 barrels of the small oysters on small stones and shells were planted on five suitable beds. An average of at least 1,500 oysters per barrel was estimated. If all survived a total of about 600 barrels would result when marketable size was reached. Even allowing for a considerable loss from clustering, starfish and other causes the transfer is believed to have been worth while in view of its low cost and its special value in maintaining the oyster stock in the area.

#### INVESTIGATIONS IN SHEDIAC BAY, NEW BRUNSWICK

Investigations in Shediac bay were discontinued in 1934 pending the completion by the Department of Pensions and National Health of their examination of conditions in the bay. Their preliminary examination in the autumn of 1933 had not sufficed for a final decision regarding the safety of direct marketing of oysters taken from the bay.

Shediac bay consists of two shallow basins, each with a tributary river connected by a narrow and very shallow passage between Shediac island and the mainland. The depth of water is for the most part less than eight feet, which favours summer warming.

A survey showed that the oyster population was in three centres of abundance, the most important of which was between Shediac island and the mainland, with the other two at the mouths of the rivers. Considerable areas of bottom suitable for oyster culture exist outside the present limits of abundance of oysters.

In 1932 no "setting" of spat was found either on cultch planted or on natural objects, and scarcity of yearlings indicated that a similar failure occurred in 1931.

The present public fishery depends on spat production in preceding years. The history of the fishery indicates that similar failures of spat production have been of common occurrence. There was an early depletion followed by limited recoveries which were erratic and of short duration. The most prolonged recovery was during the maintenance by the department of a reserve which may have insured the survival of sufficient spawning stock from one favourable period for spat production to another. In 1933 a reserve was established for this purpose and during the same year oysters from the Richibucto river were planted on a reserved bed to test the feasibility of using outside sources of cheap oysters.



## APPENDIX NO. 7.

### REPORT MADE TO THE 21st MEETING OF THE NORTH AMERICAN COUNCIL ON FISHERY INVESTIGATIONS AT HALIFAX, N.S. SEPTEMBER, 1934, BY THE COUNCIL'S SUB-COMMITTEE ON HADDOCK INVESTIGATIONS

A meeting was held, there being present Dr. Thompson, Dr. Vladykov and Mr. Herrington, with Dr. Needler and Mr. Hachey present as advisers. The following report was agreed upon:

The committee urges the council to go on record, as it did in 1929, as viewing the existing haddock situation with the utmost alarm.

The committee endorses the opinion expressed at the general meeting of the council that the haddock problem has become of major importance to Canada and the United States (on the Atlantic coast); that immediate steps should be taken to adopt a common plan of investigation, which would adequately keep the situation under review and lead to the adoption of remedial measures. It directs attention to the tendency in Europe to legislate in favour of protecting young haddock by enlarging the size of net meshes. Some further experimental work beyond that already done is necessary to determine the precise alteration in size of mesh which would be necessary to allow to escape alive a large proportion of haddock below the minimum size used commercially.

Further, the committee urges the adoption of a joint program of intensified research into the biology of the haddock, with chief attention to the following aspects:—Determination of spawning grounds, types of haddock composing the shoal, distribution of eggs, larvae and fry, distribution and relative numbers of early bottom stages and of later stages, study of racial and other characteristic features of haddock populations on the chief banks, analyses of growth rates, age groups and food, tagging, especially prior to spawning on offshore grounds, relationship to physical conditions, which should be continuously recorded at or very near several regular stations, possible ultimate issuing of monthly or other bulletins as to fishing prospects, collection and analysis of adequate statistics of grounds occupied by trawlers and the catches obtained per unit of fishing effort by the fishing fleets.

The committee finds that existing facilities are quite inadequate to enable this broad program to be entered into. The prime essential is a suitably equipped research vessel, in the absence of which it is strongly recommended that the investigators be given the fullest possible facilities for securing observations on all available government, commercial and research vessels, working in this area. Thus Canada would secure observations and material from *M. V. Zoarces*, commercial trawlers and probably the hospital ship *Arras* and the ice-breaking vessel. Some co-operation would be received from Newfoundland, which would particularly survey the situation on Grand bank, but also give some attention to the northern boundary of the Western Bank area. The United States expert could doubtless secure a considerable amount of co-operation from the *Atlantis*, and use commercial trawlers.

Additional personnel will be essential in both countries; as far as the United States part of the program is concerned at least two fish measures or quay men would be required to collect statistics of commercial catches, and a technical assistant would be necessary to assist in laboratory work and sorting of material. One fish measurer and one laboratory assistant might suffice in the case of Canada.



It is recognized that, even by making such provision, the authorities will not provide for a full completion of the program outlined. Some aspects—especially those of the early haddock stages—will receive quite inadequate attention in the absence of the provision of a suitable research vessel. The Canadian and United States experts have agreed to interchange material and each to take charge of various items in the program of research.

In view of the apparent infrequency of occurrence of very successful year broods of haddock, it is recommended that intensive investigations on the lines suggested be continued for a maximum period of five years, at the end of which time the situation could be reconsidered. It is also recommended that at the first sign of the occurrence of such a brood, all possible means be taken to intensify efforts of investigation, since experience has shown that the most informative results can be obtained at such a time.

# APPENDIX NO. 8

## SUMMARY OF EXPENDITURE AND REVENUE BY PROVINCES, IN THE FISHERIES SERVICE 1867-1934-35, UNDER THE DOMINION GOVERNMENT AND FINANCIAL STATEMENT OF THE DEPARTMENT OF FISHERIES FOR 1934-35.

	Expenditure	Revenue
	\$ cts.	\$ cts.
Nova Scotia.....	6,421,612 73	410,297 00
Prince Edward Island.....	1,033,550 93	120,484 99
New Brunswick.....	4,615,092 08	631,628 15
Quebec.....	2,441,497 84	341,871 12
Ontario.....	3,220,234 14	520,236 81
Manitoba and Northwest Territories.....	23,414 29	4,779 25
Manitoba.....	1,763,968 84	334,589 81
Northwest Territories.....	58,258 58	9,775 23
Alberta.....	518,261 96	226,736 41
Saskatchewan.....	575,983 42	101,945 16
British Columbia.....	14,697,484 27	2,796,147 36
Yukon.....	29,343 94	13,622 75
Hudson Bay District.....		821 83
	35,398,703 02	5,512,935 87
Cruisers, N.S., P.E.I., N.B.....	5,777,736 37	
Expenditure, general.....	5,240,897 68	
Fishing bounty.....	8,388,338 86	
	54,805,675 93	

## FINANCIAL STATEMENT, 1934-35

Vote No.	Appropriations	Amount	Expenditure
151	Sals. and Disbs. fishery officers.....	892,000 00	442,602 59
	Fisheries Patrol Service.....		235,551 47
	Fisheries Protection Service.....		192,984 33
152	Building fishways and clearing rivers.....	6,000 00	871,138 39
153	Legal and incidental expenses.....	6,000 00	4,588 41
154	Conservation and development of deep-sea fisheries, etc.....	85,000 00	2,587 06
155	Fish culture.....	240,000 00	63,068 59
156	Oyster culture.....	10,000 00	210,816 01
157	International Fisheries Commission (Halibut).....	25,000 00	9,770 70
158 and Sal. Ded. Act 1934, Sec. 3 Ch. 22	Marine Biological Board of Canada.....	175,000 00	24,968 74
159	Grant to United Maritime fishermen.....	4,050 00	176,793 25
8	Civil Government salaries.....	1,444,843 25	1,367,781 15
8	Civil Government contingencies.....	107,082 00	99,004 95
Statutory	Fishing bounty.....	27,000 00	11,181 11
		160,000 00	159,976 25
Statutory	Salary Deduction Act 1934, <i>re</i> Superannuation and Retirement Fund contributions.....	1,738,925 25	1,637,943 46
Statutory	Miscellaneous gratuities.....		1,498 50
			1,120 00
	ASSETS—"Special Account United States Government <i>re</i> Pacific Halibut Treaty" (Being balance due Canada on divisible expenses at the close of the fiscal year 1934-35, by the United States Government).		1,640,561 96
			3,957 28
			1,644,519 24

## STATEMENT OF REVENUE RECEIVED DURING THE FISCAL YEAR 1934-35

Class	Total	General Account	Nova Scotia	Prince Edward Island	New Brunswick	Quebec	Ontario	British Columbia	Yukon
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Fisheries revenue.....	42,934 85		10,221 00	1,600 75	10,180 50	333 00	19 85	20,049 75	530 00
Fines and forfeitures.....	8,336 02		1,089 70	310 55	1,300 47	17 50		5,618 00	
Modus vivendi.....	227 00		116 00					111 00	
Fish culture revenue.....	1,547 42				1,191 07			356 35	
Premium, discount and exchange.....	0 40	0 25		0 15					
Pelagic sealing revenue.....	89,549 74	89,549 74							
Casual revenue.....	6,837 22	222 03	1,627 64	2,667 30	1,337 42	34 50		948 33	
	149,432 65	89,772 02	13,054 34	4,578 55	14,009 46	385 00	19 85	27,083 43	530 00
Refund of sales received prior to 1934-35.....	-224 25								
	149,208 40								

## EXPENDITURE 1934-35—SUMMARY OF SALARIES AND DISBURSEMENTS OF FISHERY OFFICERS

—	Totals	Personal Services	Supplies and Materials	Travel Expenses	Equipment	Communication Services	Transportation of Things	Advertising and Publicity	Grants Subs. Contrs.	Prof. and Special Services	Rents	Miscellaneous Current Expenses
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
N. Scotia	164,234 10	122,032 11	4,253 79	29,881 40	4 82	6,815 03	441 26	18 20		117 94		669 55
P. E. Isl.	22,143 41	13,794 25	2,225 70	4,909 13	12 37	741 56	82 94	7 90		290 31		79 25
Quebec.....	5,651 30	3,798 80	5 30	1,583 59		106 97						156 70
(M.I.)												
N. Bruns.	114,356 69	83,415 83	3,794 19	23,029 70		2,621 51	238 63			1,019 21	4 00	233 62
Brit. Col.	136,217 03	91,544 82	7,667 58	28,066 35		6,886 28	904 01		40 00	29 50	468 49	610 00
	442,002 59	314,585 81	17,946 56	87,470 17	17 19	17,171 35	1,666 84	26, 10	40 00	1,456 96	472 49	1,749 12



## DEPARTMENT OF FISHERIES

## FISHERIES PATROL SERVICE—EXPENDITURE 1934-35 AND SUMMARY

NOVA SCOTIA—	
District No. 2—	
Departmental boats.....	\$ 11,138 79
Chartered boats.....	3,492 80
District No. 3—	
Departmental boats.....	12,581 44
	<hr/> \$ 27,213 03
PRINCE EDWARD ISLAND—	
Departmental boats.....	2,172 48
Chartered boats.....	4,202 07
	<hr/> 6,374 55
NEW BRUNSWICK—	
District No. 1—	
Departmental boats.....	11,152 15
District No. 2—	
Departmental boats.....	1,811 26
Chartered boats.....	16,521 29
	<hr/> 29,484 70
GENERAL ACCOUNT—EAST.....	4 00
BRITISH COLUMBIA—	
General.....	2,734 73
Digby Island.....	4,962 39
Poplar Island.....	1,904 68
Air Patrol.....	18,351 66
District No. 1—	
Departmental boats.....	16,669 12
Chartered boats.....	3,349 45
General.....	334 31
District No. 2—	
Departmental boats.....	31,897 22
Chartered boats.....	31,296 38
New boats.....	12,717 88
General.....	166 15
District No. 3—	
Departmental boats.....	23,596 99
Chartered boats.....	24,897 28
General.....	96 95
	<hr/> 172,475 19
	<hr/> 235,551 47

## SUMMARY

Nova Scotia.....	27,213 03
Prince Edward Island.....	6,374 55
New Brunswick.....	29,484 70
General Account—East.....	4 00
British Columbia.....	172,475 19
	<hr/> 235,551 47

## FISHERIES PROTECTION SERVICE—SUMMARY FOR 1934-35

East coast.....	\$ 80,916 17
West coast.....	112,068 16
	<hr/> \$ 192,984 33

## DETAILED STATEMENT OF FISH CULTURE, 1934-35

Hatcheries	Personal Services	Other Outlay	Totals by Hatcheries	Totals by Provinces
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>Nova Scotia</i> .....				56,338 31
Antigonish.....	7,668 25	7,011 67	14,679 92	
Bedford.....	3,605 30	2,664 23	6,269 53	
Lindloft.....	2,488 24	1,603 72	4,091 96	
Margaree.....	4,744 30	2,456 63	7,200 93	
Margaree Pond.....	2,162 92	2,332 38	4,495 30	
Middleton.....	3,871 88	2,225 83	6,097 71	
Nictaux Pond.....	611 50	678 44	1,289 94	
Phillip River Pond.....	622 50	469 19	1,091 69	
Sackville River Pond.....	427 80	25 80	453 60	
Yarmouth.....	4,631 94	6,035 79	10,667 73	
<i>Prince Edward Island</i> .....				5,066 97
Kelly's Pond Hatchery.....	3,438 60	1,090 34	4,528 94	
Morrell River Pond.....	469 05	68 98	538 03	
<i>New Brunswick</i> .....				44,935 22
Florenceville.....	4,668 84	3,056 12	7,724 96	
Grand Falls.....	3,491 80	2,917 21	6,409 01	
Miramichi.....	4,597 50	1,467 09	6,064 59	
Miramichi Pond.....	1,080 00	452 76	1,532 76	
New Mills Pond.....	1,695 63	1,729 97	3,425 60	
Nipisiquit.....	411 55	59 30	470 85	
Restigouche.....	2,886 60	865 77	3,752 37	
Saint John.....	6,216 00	3,067 85	9,283 85	
Saint John Pond.....	1,676 30	4,501 20	6,177 50	
Tobique.....	16 00	77 73	93 73	
<i>General Account</i> .....				3,345 34
General Account—East.....	10 00	753 21	763 21	
General Account (Bartibogue Pond, N.B.).....	546 30	867 60	1,413 90	
General Account (Chamcook Lake, N.B.).....	96 00	138 24	234 24	
General Account (Grand Lake, N.B.).....	297 55	537 74	835 29	
General Account (Wittenburg Pond, N.S.).....	29 16	69 54	98 70	
<i>Supervisor, Engineer and Staff—East</i> .....	4,670 70	2,374 75	7,045 45	7,045 45
<i>British Columbia</i> .....				94,084 72
General Account.....		398 04	398 04	
General Account (Beaver Lake).....	503 74	396 03	899 77	
General Account (Cranbrook).....		1,626 14	1,626 14	
General Account (Fish Lake).....	291 76	163 07	454 83	
General Account (Furunculosis Inv.).....	600 00	543 56	1,143 56	
General Account (Gerrard).....	36 00		36 00	
General Account (Harrison).....	4,542 50	1,029 74	5,572 24	
General Account (Nanaimo Inv.).....	12 76	39 84	52 60	
General Account (Qualicum Ponds).....	189 46	357 12	546 58	
General Account (Stuart).....		21 91	21 91	
General Account (Wood's Lake Inv.).....	30 00	51 25	81 25	
Supervisor, Engineer and Staff.....	7,398 00	853 68	8,251 68	
Anderson.....	4,756 67	854 05	5,610 72	
Babine.....	5,485 14	2,472 35	7,957 49	
Cowichan.....	4,237 18	1,557 48	5,794 66	
Cultus.....	8,333 96	2,978 53	11,312 49	
Kennedy.....	5,481 08	768 11	6,249 19	
Lakelse (Skeena).....	6,319 57	1,163 81	7,483 38	
Lardeau.....	257 05	130 23	387 28	
Lloyds Creek.....	1,313 85	729 11	2,042 96	
Nelson.....	3,615 08	911 18	4,526 26	
Pemberton.....	6,065 12	483 56	6,548 68	
Penask.....	1,110 88	861 61	1,972 49	
Pitt.....	4,192 11	509 88	4,701 99	
Rivers Inlet.....	8,074 73	1,818 13	9,892 86	
Summerland.....	142 45	377 22	519 67	
<i>Fish Culture—Total</i> .....				210,816 01

## DEPARTMENT OF FISHERIES

## SUMMARY

Provinces	Personal Services	Other Outlay	Totals by Provinces	Grand Total
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Nova Scotia.....	30,834 63	25,503 68	56,338 31	
Prince Edward Island.....	3,907 65	1,159 32	5,066 97	
New Brunswick.....	26,740 22	18,195 00	44,935 22	
General Account—East.....	979 01	2,366 33	3,345 34	
Supervisor, Engineers and Staff—East.....	4,670 70	2,374 75	7,045 45	
British Columbia.....	72,989 09	21,095 63	94,084 72	
	140,121 30	70,694 71	.....	210,816 01

DETAILED STATEMENT OF CONSERVATION AND DEVELOPMENT OF DEEP-SEA  
FISHERIES—EXPENDITURE 1934-35

*Lobster Collection Service, N.S.—*

"Nova II".....	5,691 39	
"Nova IV".....	5,878 27	
"Ile Madame".....	4,540 39	
"Dominion Halsyd".....	3,121 78	
"Southwind".....	518 17	
Allowance for supervision.....	400 00	

20,150 00

*Packet Service—L'Ardoise, N.S.....*

1,500 00

*Grants to Exhibitions, N.S.....*

1,800 00

*Bait Freezers—*

General.....	5 58	
Canso, N.S.....	332 72	
Cheticamp, N.S.....	18 75	
Petite de Grat, N.S.....	3,997 52	

4,354 57

*Bait Collection Service, N.S.....*

1,012 50

*Educational Work.....*

16,827 12

*Exhibitions.....*

5,843 31

*Aids in Expanding Demands for Fish—*

Cooking Demonstration.....	3,396 78	
General.....	5,289 14	

8,685 92

*General Account.....*

2,895 17

63,068 59



## MARINE BIOLOGICAL BOARD—STATEMENT OF EXPENDITURE, 1934-35

<i>St. Andrews Biological Station</i> .....	40,053 39	
Atlantic salmon investigation.....	273 23	
Cod and haddock investigation.....	1,726 25	
Cultural investigation.....	1,036 95	
General lakes survey.....	89 82	
Oyster investigation.....	954 76	
	<hr/>	44,134 40
<i>Nanaimo Biological Station</i> .....	41,779 57	
Chemical investigation.....	1,064 04	
Cowichan river investigation.....	130 70	
Pacific salmon investigation.....	31,171 79	
Pacific trout investigation.....	538 08	
Pilchard and herring investigation.....	430 99	
Pink and Chum investigation.....	2,002 41	
Shellfish investigation.....	595 71	
Summer investigation.....	498 05	
	<hr/>	50,211 34
<i>Halifax Experimental Station</i> .....	34,193 78	
Demonstration building.....	23 00	
Eastern passage laboratory.....	91 30	
Investigations.....	277 86	
Semi Commercial development.....	433 91	
Short courses.....	1,254 33	
	<hr/>	36,274 18
<i>Prince Rupert Experimental Station</i> .....	28,294 83	
Investigations.....	901 29	
	<hr/>	29,196 12
<i>General Account</i> .....		16,176 42
Total Biological Board.....		175,992 46
<i>10% Restorations—</i>		
St. Andrews.....	527 42	
Nanaimo.....	708 21	
Halifax.....	309 70	
Prince Rupert.....	247 92	
	<hr/>	1,793 25
Total Biological Board, including 10% Rest.....		177,785 71

## MARINE BIOLOGICAL BOARD—STATEMENT OF MISCELLANEOUS RECEIPTS, 1934-35

<i>St. Andrews Biological Station</i> .....	\$ 25 50
<i>Nanaimo Biological Station</i> .....	907 39
<i>General Account</i> .....	59 57
	<hr/>
	992 46

## FISHERIES EXPENDITURE BY PROVINCES, 1934-35

Appropriations	General	Nova Scotia	Prince Edward Island	New Brunswick	Quebec	Ontario	British Columbia	Totals
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Salaries and disbursements of F.O.....		164,234 10	22,143 41	114,356 69	5,651 36		136,217 03	442,602 59
Fisheries Patrol.....		27,213 03	6,374 55	29,488 70			172,475 19	235,551 47
Fisheries Protection.....		69,808 00	5,239 22	5,868 95			112,068 16	192,984 33
Building Fishways, etc.....		2,000 04		619 56			1,968 81	4,588 41
Legal and incidental expenses.....		479 39	265 00	1,628 97			213 70	2,587 06
Conservation and development of deep sea fisheries.....	13,782 06	41,652 61	1,504 55	1,225 37	1,459 95	3,031 58	412 47	63,068 59
Fish Culture.....	361 57	60,267 72	5,409 19	50,692 81			94,084 72	210,816 01
Oyster Culture.....			9,770 70				24,968 74	9,770 70
Halibut Commission.....				44,636 32			24,968 74	24,968 74
Marine Biological Board.....	16,116 85	36,583 88					79,456 20	176,793 25
Grant to U.M. Fishermen.....		1,350 00	1,350 00	1,350 00				4,050 00
Fishing Bounty.....		76,538 55	12,028 10	24,682 70	46,726 90			159,976 25
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	30,260 48	480,127 32	64,084 72	274,550 07	53,838 21	3,031 58	621,865 02	1,527,757 40
Civil Government salaries.....								99,004 95
Civil Government contingencies.....								11,181 11
Salary Deduction Act, 1934.....								1,498 50
Miscellaneous gratuities.....								1,120 00
								<hr/>
Assets—"Special Acct. United States Government re Pacific Halibut Treaty".....								1,640,561 96
(Being balance due Canada on divisible expenses at the close of the fiscal year 1934-35, by the United States Government)								3,957 28
								<hr/>
								1,644,519 24

# APPENDIX No. 9

## LICENCES ISSUED

The following is a statement of the different kinds of licences issued by the different supervisors during the 1934-35 season:—

### MAGDALEN ISLANDS, QUEBEC—SUPERVISOR S. T. GALLANT

Kind of Licences	Number of Licences issued
Lobster fishing licences.....	825
Certificates of identification—	
Licences to can lobsters.....	16
Herring seine licences.....	19
Herring trap-net licences.....	20
Smelt gill-net licences.....	336 (1 cancelled)
Smelt bag-net licences.....	4
	<hr/> 1,220 (1 cancelled)

### PRINCE EDWARD ISLAND—SUPERVISOR S. T. GALLANT

Lobster fishing licences.....	2,678 (4 cancelled)
Certificates of identification—	
Licences to can lobsters.....	96
Oyster fishery licences.....	258
Quahaug fishery licences.....	14
Certificates under section 53—4.	
Lobster pound licences.....	1
Trap-net fishing licences.....	4
Salmon trap-net or pound-net licences.....	Nil
Set salmon gill-net licences.....	6
Scallop fishery licences.....	Nil
Smelt gill-net licences.....	193 (1 cancelled)
Smelt bag-net licences.....	187 (3 box-nets)
Leases of oyster privileges—85.	
	<hr/> 3,437 (5 cancelled)

### NOVA SCOTIA—DISTRICT No. 1—SUPERVISOR A. G. McLEOD

Lobster fishing licences.....	3,112
Certificates of identification—	
Licences to can lobsters.....	33
Oyster fishery licences.....	207
Certificates under section 53—50.	
Trap-net fishing licences.....	30
Salmon trap-net, pound-net or weir licences.....	285
Special angling permits.....	131 (2 complimentary)
Set salmon gill-net licences.....	33
Gaspereau weir licences.....	3
Smelt bag-net licences.....	40 (1 box-net)
Smelt gill-net licences.....	128
	<hr/> 4,002 (2 complimentary)

### NOVA SCOTIA—DISTRICT No. 2—SUPERVISOR E. D. FRASER

Lobster fishing licences.....	4,343 (1 cancelled)
Certificates of identification—	
Licences to can lobsters.....	54
Oyster fishery licences.....	191
Quahaug fishery licences.....	1
Shad gill-net or drift-net licences.....	8
Certificates under section 53—77.	
Lobster pound licences.....	7
Seine licences.....	88
Licences to a captain of a Canadian fishing vessel (using an otter or other trawl).....	3
Herring weir licences.....	19
Trap-net fishing licences.....	81
Salmon drift-net licences.....	61
Salmon trap-net, pound-net or weir licences.....	198
Special angling permits.....	131 (1 cancelled and 5 complimentary)
Set salmon gill-net licences.....	414 (2 cancelled)
Scallop fishery licences.....	Nil
Smelt bag-net licences.....	196
Smelt gill-net licences.....	389
Lobster pound certificates—319.	
Permit (issued for scientific purposes).....	1
	<hr/> 6,185 (4 cancelled and 5 complimentary)

## NOVA SCOTIA—DISTRICT No. 3—SUPERVISOR H. H. MARSHALL

Lobster fishing licences.....	2,981 (2 cancelled)
Certificates of identification—	
Shad gill-net or drift-net licences.....	4
Certificates under section 53—152 (1 cancelled).....	
Lobster pound licences.....	15
Herring weir licences.....	59
Trap-net fishing licences.....	154
Salmon drift-net licences.....	4
Salmon trap-net, pound-net or weir licences.....	66
Salmon net permits (Medway river).....	31
Special angling permits.....	502 (3 cancelled)
Set salmon gill-net licences.....	500 (1 cancelled)
Scallop fishery licences.....	88
Smelt bag-net licences.....	27
Smelt gill-net licences.....	42
Lobster pound certificates—1,272 (1 cancelled and 1 missing).	
Lease of Long Beach pond—1.	
	<hr/> 4,473 (6 cancelled)

## NEW BRUNSWICK—DISTRICT No. 1—SUPERVISOR J. F. CALDER

Lobster fishing licences.....	394
Certificates of identification—	
Shad gill-net or drift-net licences.....	34
Certificates under section 53-3.	
Lobster pound licences.....	7
Herring weir licences.....	518
Clam permits.....	88
Salmon gill-net or drift-net licences.....	108
Herring seine licences.....	1
Scallop fishery licences.....	39
Smelt bag-net or box-net licences.....	Nil
Smelt gill-net licences.....	Nil
Lobster pound certificates—833 (3 missing).	
Lease of Dark Harbour fishing privileges—1.	
	<hr/> 1,189

## NEW BRUNSWICK—DISTRICT No. 2—SUPERVISOR A. L. BARRY

Lobster fishing licences.....	3,642 (23 free)
Certificates of identification—	
Licences to can lobsters.....	98
Oyster fishery licences.....	868 (5 free)
Quahaug fishery licences.....	66
Shad gill-net or drift-net licences.....	Nil
Certificates under section 53—308 (5 cancelled)	
Lobster pound licences.....	3
Herring weir licences.....	Nil
Gaspereau pound-net or trap-net licences.....	119
Salmon gill-net or drift-net licences.....	191
Salmon trap-net, pound-net or weir licences.....	387
Bass fishery licences.....	Nil
Smelt bag-net or box-net licences.....	5,455 (2 cancelled, 1 lost, 49 free)
Smelt gill-net licences.....	271
Lobster pound certificates—223.	
	<hr/> 11,100 (2 cancelled, 1 lost, 77 free)

## NEW BRUNSWICK—DISTRICT No. 3—SUPERVISOR L. H. PARKS

Shad gill-net or drift-net licences.....	152 (1 cancelled)
Sturgeon fishery licences.....	2
Whitefish fishery licences.....	12
Salmon net permits (St. John river).....	136
Gaspereau pound-net or trap-net licences.....	Nil
Salmon gill-net or drift-net licences.....	169
Salmon trap-net, pound-net or weir licences.....	101
Gaspereau gill-net licences.....	131
Bass fishery licences.....	40
Receipt books—425 (3 cancelled)	
	<hr/> 743 (1 cancelled)



## DEPARTMENT OF FISHERIES

## HUDSON BAY AND JAMES BAY

Gill-net permit.....	1
Permit (issued for scientific purposes).....	1
Special angling permits.....	4
	<hr/>
	6

## PROVINCE OF BRITISH COLUMBIA—CHIEF SUPERVISOR J. A. MOTHERWELL

Kind of Licences	Number of Licences Issued
Small dragger licences.....	23 (1 cancelled)
Special angling permits.....	1,474 (6 cancelled)
Abalone fishery licences.....	11
Indian permits.....	2,103
Cod fishery licences.....	381 (8 cancelled)
Crab fishery licences.....	100
Smelt or sardine fishery licences.....	58 (3 cancelled)
Miscellaneous licences.....	112 (2 cancelled)
Salmon fishery licences.....	5,438 (99 cancelled)
Salmon trolling licences.....	3,045 (11 cancelled)
Salmon trap-net licences.....	8
Salmon purse-seine licences.....	296 (1 cancelled)
Salmon drag-seine licences.....	9
Licences to a captain of a salmon purse-seine boat.....	135 (1 cancelled)
Grayfish fishery licences.....	152
Licences to assistant operators of salmon (purse or drag) seines.....	1,657 (1 cancelled)
Licences to assistants in a boat used in operating a salmon gill-net or drift-net...	1,210 (13 cancelled)
Licences to captain of a Canadian halibut fishing boat.....	11
Herring gill-net or drift-net licences.....	20
Herring purse-seine licences.....	24 (2 drag-seines)
Pilchard purse-seine licences.....	21
Licences to a captain of a herring purse-seine boat.....	12
Licences to a captain of a pilchard purse-seine boat.....	18
Licences to assistant operators of herring purse-seines.....	344 (3 cancelled)
Whaling licences.....	6
Licences to assistant operators of pilchard purse-seines.....	135
Herring pound permits.....	10
Receipt books—Nil.	
Pelagic sealing certificates—3.	
	<hr/>
	16,813 (149 cancelled)

## YUKON TERRITORY

Special fishery licences.....	29
-------------------------------	----

## PACIFIC COAST

Licences to United States halibut fishing vessels.....	198
--	-----

## ATLANTIC COAST

Licences to United States fishing vessels.....	121 (5 cancelled)
--	-------------------

## NORTHWEST TERRITORIES

Reduction works licences.....	3
Walrus licences.....	

# APPENDIX No. 10

## COMPARATIVE STATEMENT OF LOBSTER FISHING LICENCES FROM 1928

### PRINCE EDWARD ISLAND AND MAGDALEN ISLANDS

Year	Magdalen Island	Prince County	Kings County	Queens County	Kings and Queens (Southern portion)	Totals
1928.....	682	925	616	337		2,560
1929.....	659	857	509	271		2,296
1930.....	644	922	573	285		2,424
1931.....	526	894	521	283		2,224
1932.....	526	1,409	308	402	398	3,043
1933.....	599	1,359	324	438	485	2,606
1934.....	825	1,190	483	459	542	3,499

### NOVA SCOTIA—DISTRICT No. 1

Year	Inverness County	Richmond County	Cape Breton County	Victoria County	Totals
1928.....	537	648	462	376	2,023
1929.....	501	636	435	329	1,901
1930.....	496	682	442	343	1,963
1931.....	473	745	458	367	2,043
1932.....	542	897	578	426	2,443
1933.....	656	1,092	773	534	3,055
1934.....	701	1,060	790	561	3,112

### NOVA SCOTIA—DISTRICT No. 2

Year	Halifax Office	Halifax County	Patrol Boat Thresher	Guys- boro County	Antig- onish County	<sup>a</sup> Pictou and Col- chester	<sup>a</sup> Cum- berland County	<sup>b</sup> Hants Col- chester and Cum- berland County	Totals
1928....	183	976	41	1,021	334	521	171	17	3,264
1929....	153	767	435	1,047	283	358	221	7	3,271
1930....	131	1,135	204	1,087	308	349	255	9	3,478
1931....	142	1,200	170	1,139	273	352	299	15	3,590
1932....	105	1,364	14	1,330	339	462	399	14	*4,029
1933....	68	1,453	59	1,439	350	526	374	18	4,287
1934....	20	1,342	24	1,489	425	589	431	22	4,342

<sup>a</sup> Northumberland Straits side.

<sup>b</sup> Bay of Fundy side.

\* The 1932 total includes two licences issued by the District Supervisor.

DEPARTMENT OF FISHERIES

NOVA SCOTIA—DISTRICT No. 3

Year	Lunen- burg	Queens	Shel- burne	Yar- mouth	Digby	Kings	Anna- polis	Total
1928.....	563	329	966	827	470	25	119	3,299
1929.....	472	217	850	792	463	27	120	2,941
1930.....	504	250	854	768	483	28	135	3,022
1931.....	590	296	1,016	770	430	.....	128	3,230
1932.....	491	290	965	673	312	.....	148	2,879
1933.....	525	262	1,112	720	415	21	141	3,196
1934.....	481	287	1,014	705	354	24	114	2,979

NEW BRUNSWICK—DISTRICT No. 1

Year	Charlotte	Saint John	Albert and West- morland	Total
1928.....	433	86	1	520
1929.....	360	53	1	414
1930.....	288	57	2	347
1931.....	281	45	4	330
1932.....	380	101	2	483
1933.....	271	99	1	371
1934.....	*299	94	1	394

NEW BRUNSWICK—DISTRICT No. 2

Year	Northum- berland County	Resti- gouche County	Gloucester County	Kent County	West morland County	Totals
1928.....	297	50	517	501	249	*1,981
1929.....	289	43	406	583	188	*1,834
1930.....	319	46	794	638	327	2,124
1931.....	300	54	647	765	326	2,192
1932.....	394	67	933	997	435	2,826
1933.....	407	77	1,041	989	720	3,234
1934.....	512	74	1,064	1,087	905	3,642

\*The 1928 total includes 367 licences issued by the District Supervisor, the 1929 total 325 licences, and the 1934 total 3 licences, so issued.

NOTE.—Cancelled licences are not included in the figures in this appendix.



# APPENDIX No. 11 RETURN SHOWING DETAILS OF PROSECUTION FOR OFFENCES AGAINST THE FISHERIES ACT DURING THE FISCAL YEAR 1934-1935

NOVA SCOTIA—DISTRICT No. 1—SUPERVISOR A. G. McLEOD

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	Amos Landry.....	In possession of 4 undersized lobsters.....	Point Micheau (Lobster District No. 6a).....	Case dismissed, costs \$43.85, were levied against the Department.
2	James Mitchell.....	In possession of live lobsters after close of season.....	New Waterford.....	Fined \$5, fine and costs \$2.50, paid by defendant.
3	C. Plummeridge.....	Catching salmon with baited hook.....	Grand river.....	Fined \$5 and costs \$2.50.
4	Rudolph Passerino.....	Fishing oysters on Sunday.....	East Bay.....	Fined \$5 and costs \$2.50.
5	Patrick Petrie.....	Fishing oysters on Sunday.....	Eskskoni.....	Fined \$5 and costs \$2.50.
6	James Gillis.....	Spearing salmon.....	Margaree river.....	Fined \$10 and costs \$2.
7	Frances Perio.....	Having salmon in possession during close season.....	Nyanza.....	Fine of \$100 suspended for two years; costs \$2.35 paid by defendant.

NOVA SCOTIA—DISTRICT No. 2—SUPERVISOR E. D. FRASER

1	Ernest Black.....	Sawdust pollution Shinimicas river.....	Leicester.....	Fined \$20 and costs \$2 or 30 days in jail.
2	John E. Rushlon.....	Possession spent salmon.....	Maccan river.....	Fined \$1 and costs 50c.
3	Thomas H. McLean.....	Possession spent salmon.....	Maccan river.....	Fined \$1 and costs 50c.
4	Douglas Newman.....	Possession spent salmon.....	Maccan river.....	Fined \$1 and costs 50c.
5	Benjamin Livingston.....	Possession spent salmon.....	Maccan river.....	Fined \$1 and costs 50c.
6	John Hatherly.....	Possession spent salmon.....	Maccan river.....	Fined \$1 and costs 50c.
7	Eric Clarke.....	Possession spent salmon.....	Maccan river.....	Fined \$1 and costs 50c.
8	Maritime Packers, Limited.....	Possession berried lobsters.....	Maccan river.....	Fined \$1 and costs 50c.
9	Robert Bazter.....	Sawdust pollution.....	Caribou harbour.....	Fined \$10 and costs \$2.50.
10	Edgar Leslie.....	Fishing lobsters without licence.....	West North river.....	Fined \$20 and costs \$2.25.
11	Robert Baker.....	Fishing lobsters without licence.....	Spry bay.....	Fined \$3 and costs \$7.35.
12	Benjamin Cleveland.....	Possession lobster closed season.....	Clam harbour.....	Fined \$5 and costs \$6.25.
13	Scott Browne.....	(Catching salmon otherwise than by surface fly fishing.).....	West Dover.....	Fined \$10.
13a	John Cameron.....	Netting trout.....	Ingram river.....	Fined \$5 and costs \$6.30. One salmon confiscated.
13b	James Edgar Fleming.....	Netting trout.....	West river at Beaver Meadow, Antigonish county.....	Fined \$100 and costs \$7.75.
13c	Ross Fleming.....	Netting trout.....	West river at Beaver Meadow, Antigonish county.....	Fined \$75 and costs \$7.75.
		Netting trout.....	West river at Beaver Meadow, Antigonish county.....	Fined \$25 and costs \$7.75.

## NOVA SCOTIA DISTRICT No. 2—Continued

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
13d	Murdock Everett Sutherland.....	Netting trout.....	West river at Beaver Meadow, Antigonish county.	Fined \$50 and costs \$7.75. 2 nets, 2 dunnage bags, 1 fishing creel, 1 small boat, 11 trout seized and confiscated, account Prosecutions 13a, 13b, 13c and 13d.
14	George Allen.....	Fishing lobsters without licence.....	Northumberland Straits.....	Dismissed, costs \$6.55 paid by Department.
15	Milburn Keenan.....	Possession lobsters closed season.....	Northumberland Straits off Gulf shore.	Fined \$5 and costs 75c. or 10 days jail.
16	Warren Mills.....	Possession lobsters closed season.....	Pictou.....	Fined \$10 and costs \$5.
17	Fernie Mills.....	Possession lobsters closed season.....	Pictou.....	Fined \$10 and costs \$5.
18	Augustus Keenan.....	Possession lobsters closed season.....	Northumberland straits off Gulf shore.	Fined \$5 and costs 75c. or 10 days in jail. 12 crates lobsters confiscated, account Prosecution Nos. 15, 16, 17 and 18.
19	Howard White.....	Possession lobsters closed season.....	Northumberland straits off Gulf shore.	Fined \$5 and costs 75c. or 10 days jail.
20	Alvin McKenzie.....	Possession lobsters closed season.....	Northumberland straits off Gulf shore.	Fined \$1 and costs 75c. or 10 days jail.
21	Howard Casey.....	Netting salmon grilse and trout.....	Gulf shore.	Fined \$5 and costs \$2.50.
22	Sterling Ross.....	Possession lobsters closed season.....	Port Dufferin.....	Fined \$10 and costs \$3.75.
23	Alex. Peers.....	Fishing lobsters closed area.....	East Wallace.....	Fined \$10 and costs \$6.15, 1 motor boat confiscated.
24	Stanley Chase.....	Fishing lobsters closed area.....	Off Pugwash.....	Fined \$5 and costs \$3.80, 1 motor boat confiscated.
25	Basil Langille.....	Fishing lobsters closed area.....	Off Pugwash.....	Fined \$10 and costs \$7.95, 1 motor boat confiscated.
26	Ralph Allen.....	Fishing lobsters closed area.....	Off Pugwash.....	Fined \$10 and costs \$6.30, 1 motor boat confiscated.
27	Stanley Pace.....	Possession lobsters closed season.....	Marie Joseph.....	Fined \$10 and costs \$6.35 or 10 days in jail.
28	Colin J. Chisholm.....	Fishing smelt gill-nets without licence.....	Antigonish harbour.....	Fined \$5 and costs \$4.
29	Joseph McLellan.....	Fishing smelt gill-nets without licence.....	Antigonish harbour.....	Fined \$5 and costs \$4.
30	Leo Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
31	Milton Hartling.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
32	Ervin Martin.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
33	Alvin Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
34	George Drew.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
35	Rufus Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
36	Tan Hartling.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
37	Freeman Brophy.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
38	Clement Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
39	Hilton Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
40	Robert Little.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.

41	Harold Jollimore.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
42	Willis Jollimore.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
43	Russell Jollimore.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
44	Ervin Harrie.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
45	Dave Harrie.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
46	James E. Pettipas.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
47	John Pettipas.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
48	Darris Shubley.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
49	Clifford Shubley.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
50	Luke Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
51	Warren Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
52	Darrell Harrie.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
53	Vincent Martin.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
54	Foster Hartling.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
55	Nelson Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
56	Charles A. Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
57	Cecil Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
58	Gordon Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
59	Lindsay Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
60	William Pettipas.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
61	Jeremiah Slaunwhite.....	Setting lobster gear before season.....	Terence bay.....	Fined \$1.
62	Napoleon Slaunwhite.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
63	Charles Welsh.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
64	Sherman Kiley.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
65	Jerome Kiley.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
66	Oswald Christian.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
67	Douglas Christian.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
68	Cecil Christian.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
69	Lee White.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
70	John Edgar Welsh.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
71	Joe Welsh.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
72	Scott Beck.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
73	John Kiley.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
74	Bernard Kiley.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
75	George Coolen.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
76	Thomas Meehan.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
77	Louis White.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
78	Ray Doherty.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
79	George Christian.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
80	Wallace Christian.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
81	Earl Duggan.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
82	J. O. Duggan.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
83	Everette Christian.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
84	Jack Shea.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
85	Bert Christian.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
86	Richard Duggan.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
87	Albert Duggan.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
88	Jos. Christian.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
89	Russell Christian.....	Setting lobster gear before season.....	Prospect.....	Fined \$1.
90	Richard Duggan, Sr.....	Setting lobster gear before season.....	Shad bay.....	Fined \$1.



NOVA SCOTIA DISTRICT No. 2—*Concluded*

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
91	Richard Duggan, Jr.	Setting lobster gear before season.	Shad bay.	Fined \$1.
92	Milton Duggan.	Setting lobster gear before season.	Shad bay.	Fined \$1.
93	Fred Duggan.	Setting lobster gear before season.	Shad bay.	Fined \$1.
94	Charles Duggan.	Setting lobster gear before season.	Shad bay.	Fined \$1.
95	Harold Duggan.	Setting lobster gear before season.	Shad bay.	Fined \$1.
96	Thomas Brennan.	Setting lobster gear before season.	Shad bay.	Fined \$1.
97	Cecil Coolen.	Setting lobster gear before season.	Shad bay.	Fined \$1.
98	Wm. H. Coolen.	Setting lobster gear before season.	Shad bay.	Fined \$1.
99	Samuel Brennan.	Setting lobster gear before season.	Shad bay.	Fined \$1.
100	Harris Morrish.	Possession of berried lobsters.	West Dover.	Dismissed, costs \$19.60, paid by Department.
101	George V. Gray.	Setting lobster gear before season.	Pennant.	Fined \$1.
102	Cecil Gray.	Setting lobster gear before season.	Pennant.	Fined \$1.
103	Gordon Gray.	Setting lobster gear before season.	Pennant.	Fined \$1.
104	Norman Gray.	Setting lobster gear before season.	Pennant.	Fined \$1.
105	James Gray.	Setting lobster gear before season.	Pennant.	Fined \$1.
106	George Gray.	Setting lobster gear before season.	Pennant.	Fined \$1.
107	Harold Gray.	Setting lobster gear before season.	Pennant.	Fined \$1.
108	Wm. Tough.	Setting lobster gear before season.	Pennant.	Fined \$1.
109	Vincent Tough.	Setting lobster gear before season.	Pennant.	Fined \$1.
110	Charles Gray.	Setting lobster gear before season.	Pennant.	Fined \$1.
111	J. Francis Gray.	Setting lobster gear before season.	Pennant.	Fined \$1.
112	J. C. Gray.	Setting lobster gear before season.	Pennant.	Fined \$1.
113	Basil Gray.	Setting lobster gear before season.	Pennant.	Fined \$1.
114	Ralph Nickerson.	Setting lobster gear before season.	Pennant.	Fined \$1.
115	Russell Nickerson.	Setting lobster gear before season.	Pennant.	Fined \$1.
116	Harry Nickerson.	Setting lobster gear before season.	Pennant.	Fined \$1.
117	Aubrey Kirk.	Setting lobster gear before season.	Pennant.	Fined \$1.
118	George Kirk.	Setting lobster gear before season.	Pennant.	Fined \$1.
119	Sam Marryatt.	Setting lobster gear before season.	Pennant.	Fined \$1.
120	Austin Marryatt.	Setting lobster gear before season.	Pennant.	Fined \$1.
121	Arthur Marryatt.	Setting lobster gear before season.	Pennant.	Fined \$1.
122	Charles Marryatt.	Setting lobster gear before season.	Pennant.	Fined \$1.
123	Edward Marryatt.	Setting lobster gear before season.	Pennant.	Fined \$1.
124	Robie Marryatt.	Setting lobster gear before season.	Pennant.	Fined \$1.
125	Fred Marryatt.	Setting lobster gear before season.	Pennant.	Fined \$1.
126	Everette Marryatt.	Setting lobster gear before season.	Pennant.	Fined \$1.
127	Edward Brennan.	Setting lobster gear before season.	Pennant.	Fined \$1.
128	Douglas Brennan.	Setting lobster gear before season.	Shad bay.	Fined \$1.

## NOVA SCOTIA—DISTRICT No. 3—SUPERVISOR H. H. MARSHALL

1	Bernard Seeley.....	Smelts in possession in close season.....	North Range, Digby co.....	Fined \$10 and costs of \$6.85; 80 dozen smelts confiscated and destroyed.
2	Watters Hutchins.....	Smelts in possession in close season.....	North Range, Digby co.....	Fined \$10 or 30 days in gaol; went to gaol; costs \$6.85, to be paid by department.
3	Edward Kenney.....	Sixty under-sized lobsters in possession.....	Arcadia, Yarmouth co.....	Fined \$20 and costs, \$9.20; lobsters confiscated.
4	Donald Smith.....	Under-sized lobsters in possession.....	Arcadia, Yarmouth co.....	Fined \$15 and costs, \$2.25; 20 lobsters confiscated and liberated.
5	Wentworth Porter.....	Under-sized lobsters in possession.....	Kelly's Cove, Yarmouth co.....	Fined \$10 and costs, \$2.25; 25 lobsters confiscated and liberated.
6	Isaac S. Risser.....	Violation of Lobster Fishery Regulations.....	Lower Rose bay.....	Fined \$25 and costs, \$9.45; 36 lobsters confiscated and liberated.
7	Nathaniel MacDonald.....	Under-sized lobsters in possession.....	Lunenburg.....	Fined \$5 and costs; 25 lobsters confiscated.
8	Richard Knickle.....	Under-sized lobsters in possession.....	Lunenburg.....	Fined \$5 and costs, \$4; 40 lobsters confiscated and liberated.
9	Laurence H. Doucett.....	Illegal salmon fishing.....	Hubard's point, Tusket river.....	Fined \$3 and costs, \$2.50; 1 salmon gill-net confiscated and destroyed.
10	LeRoy Bolliver.....	Violation Sec. 4, Lobster Fishery Regulations.....	Coffins island.....	Case dismissed, costs to be paid by department; 3 lobster crates confiscated and destroyed.
11	Archibald Teal.....	Violation Sec. 4, Lobster Fishery Regulations.....	Coffins island.....	Case dismissed, costs to be paid by department.
12	Ernest Smith.....	Fishing for lobsters without a licence.....	Sanford, Yarmouth co.....	Fined \$1 and costs, \$4.75.
13	Fletcher Elliott.....	Fishing for lobsters without a licence.....	Port Maitland, Yarmouth co.....	Fined \$1 and costs, \$7.55.
14	Elroy Elliott.....	Fishing for lobsters without a licence.....	Port Maitland, Yarmouth co.....	Fined \$1 and costs, \$4.75.
15	Gordon Hayes.....	Fishing for lobsters without a licence.....	Kelley's Cove, Yarmouth co.....	Fined \$1 and costs, \$4.75.
16	John Fitzgerald, Jr.....	Fishing for lobsters without a licence.....	Yarmouth harbour.....	Fined \$1 and costs, \$4.75.
17	Herbert Smith.....	Fishing for lobsters without a licence.....	Sanford, Yarmouth co.....	Fined \$1 and costs, \$4.75.
18	Everett Haskell.....	Fishing for lobsters without a licence.....	Port Maitland, Yarmouth co.....	Fined \$1 and costs, \$4.75.
19	Norman Cushing.....	Fishing for lobsters without a licence.....	Pembroke shore, Yarmouth co.....	Fined \$1 and costs, \$4.75.
20	Walter I. Sollows.....	Fishing for lobsters without a licence.....	Port Maitland, Yarmouth co.....	Fined \$1 and costs, \$4.75.
21	Keith Churchill.....	Fishing for lobsters without a licence.....	Sanford and Short beach, Yarmouth Co.....	Fined \$1 and costs, \$4.75.
22	Harold Cann.....	Fishing for lobsters without a licence.....	Port Maitland, Yarmouth co.....	Fined \$1 and costs, \$4.75.
23	Geo. Watkins.....	Fishing for lobsters without a licence.....	Yarmouth harbour.....	Fined \$1 and costs, \$4.75.
24	Edwin Watkins.....	Fishing for lobsters without a licence.....	Yarmouth harbour.....	Fined \$1 and costs, \$4.75.
25	Peritor Conrad.....	Violation of Lobster Fishery Regulations.....	Medway estuary, Lunenburg co.....	Fined \$10 and costs, \$4.37, or 20 days in gaol; commitment issued, 10 illegal size lobsters confiscated and liberated.
26	Perry Conrad.....	Violation of salmon net regulations.....	Medway river estuary, Lunenburg co.....	Fined \$5 and costs, \$4.37, or 10 days in gaol; went to gaol; 1 salmon net confiscated.

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
27	Emmerson Conrad.....	Violation of salmon net regulations.....	Medway river estuary, Lunenburg co.	Fined \$5 and costs, \$4.37 or 10 days in gaol; went to gaol; 1 salmon net confiscated.
28	Ernest Slauenwhite.....	Violation of salmon net regulations.....	Medway river estuary, Lunenburg co.	Case dismissed; costs of \$4.37 to be paid by department; 1 salmon net confiscated.
29	Frank Selig.....	Violation of salmon net regulations.....	Medway river estuary, Lunenburg co.	Fined \$5 and costs; 1 salmon net confiscated.
30	Llewelyn Smith.....	Fishing for lobsters without a licence.....	Cheboque point, Yarmouth co.	Fined \$1 and costs, \$3.50.
31	Ernest Point.....	Fishing for lobsters without a licence.....	Cheboque point, Yarmouth co.	Fined \$1 and costs, \$2.
32	Wildon Bowers.....	Violation of salmon net regulations.....	Medway river estuary, Lunenburg co.	Fined \$5 and costs, \$8.80, or 10 days in gaol; went to gaol.
33	Bernard Zwicker.....	Violation of Sec. 20, Salmon Sub. sec. 1.....	Tailrace of Charleston pulp mill, Medway river.	Fined \$3 and costs, \$3.65.
34	David Parnell.....	Violation of Sec. 20, Salmon s.s. 4.....	McLeod falls, Medway river.	Fined \$5 and costs, \$4.15.
35	Albert Hirtle.....	Violation of Sec. 20, Salmon s.s. 4.....	McLeod falls, Medway river.	Fined \$5 and costs, \$4.15.
36	Star Mader.....	Illegal salmon fishing.....	East river.....	Fined \$3 and costs, \$2.35.
37	Albert Oikle.....	Illegal salmon fishing.....	East river.....	Fined \$3 and costs, \$2.35.
38	Archibald Teal.....	Fishing for lobsters without a licence.....	Coffins island and vicinity of Queens co.	Fined \$8 and costs, \$2.
39	Carl Teal.....	Fishing for lobsters without a licence.....	Coffins island and vicinity of Queens co.	Fined \$8 and costs, \$2.
40	LeRoy Bolliver.....	Fishing for lobsters without a licence.....	Coffins island and vicinity of Queens co.	Fined \$8 and costs, \$2.
41	Lawrence Bolliver.....	Fishing lobsters without a licence.....	Coffins island and vicinity of Queens co.	Fined \$8 and costs, \$2.80.
42	Malcolm Bolliver.....	Fishing lobsters without a licence.....	Coffins island and vicinity of Queens co.	Fined \$8 and costs, \$2.80.
43	Marshall Selig.....	Violation Lobster Fishery Regulations Sec. 4.....	Port Medway harbour.....	Fined \$2 and costs, \$3.63. 1 lobster trap and 1 lobster hand pot confiscated and destroyed.
44	Basil Selig.....	Violation of Sec. 20, Salmon s.s. 2.....	Port Medway harbour.....	4 months' suspended sentence; costs \$3.63 paid by defendant; 1 salmon gill-net confiscated and destroyed.
45	Clarence Hirtle.....	Violation of Sec. 20, Salmon s.s. 1.....	Salter falls, fish trap, Medway river.	Fined \$2 and costs, \$1.75; 2 gaffs confiscated and destroyed.
46	C. M. Cossaboorn.....	Illegal shad fishing.....	Nictaux river near Rogers dam	Fined \$5 and costs, \$3.20; 1 dip-net confiscated and destroyed.
47	Stephen Bezanson.....	Illegal shad fishing.....	Nictaux river near Rogers dam	Fined \$5 and costs, \$3.20; 1 dip-net confiscated and destroyed.
48	James Adams.....	Illegal shad fishing.....	Nictaux river near Rogers dam	Fined \$5 and costs, \$3.20; 1 dip-net confiscated and destroyed.



49	Charlie Balcolm.....	Illegal shad fishing.....	Nictaux river near Rogers dam	Fined \$10 and costs, \$4.15; 4 wire dip-nets confiscated and destroyed.
50	Arnold Vidito.....	Illegal salmon fishing.....	Nictaux river near Rogers dam	Fined \$10 and costs, \$4.15; 1 wire screen and gate confiscated and destroyed.
51	Gilbert Zinek.....	Violation of Sec. 4, Lobster Fishery Regulations.....	Garden Lots, Lunenburg co....	Fined \$25 and costs, \$7.75; moiety paid to complainant. Remnants of boiled lobsters confiscated as evidence and later destroyed.
52	Sumner McLaughlin.....	Illegal fishing.....	Non-tidal waters of Annapolis river.	Case dismissed; costs of \$13.05 to be paid by department; nets confiscated and destroyed.
53	Carl Messenger.....	Violation of Sec. 14, s.s. 1, Fisheries Act.....	Non-tidal waters of Annapolis river.	Fined \$25 and costs, \$3.85, or 2 months in gaol; went to gaol. Costs paid by department. 1 net confiscated.
54	Sumner McLaughlin.....	Violation of Sec. 14, s.s. 1, Fisheries Act.....	Non-tidal waters of Annapolis river.	Fined \$30 and costs, \$7.60; 1 boat confiscated and destroyed.
55	Eugene Roy.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	S.W. Port Mouton.....	No fine as under age; costs of \$2 to be paid by defendant; 9 lobsters confiscated and destroyed.
56	Walford Manthorne.....	Violation of Sec. 42, R.S., c. 73, S. 54.....	Thirstillwater falls, Mersey river.	Fined \$3 and costs, \$2.50, or 10 days in gaol.
57	Bevis Manthorne.....	Violation of Sec. 42, R.S., c. 73, S. 54.....	Thirstillwater falls, Mersey river.	Fined \$3 and costs, \$3.50 or 10 days in gaol.
58	Ross McLeod.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Port Mouton harbour.....	Fined \$4 and costs, \$1.75.
59	Israel Wharton.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Liverpool harbour, near Coffins island.	Fined \$3 and costs, 25c.
60	Thomas Purdy.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Liverpool harbour, near Coffins island.	Fined \$1.50 and costs, 25c.; 5 lobster traps and 75 fathoms of mooring confiscated and destroyed.
61	Donald Purdy.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Liverpool harbour near Coffins island.	Fined \$1.50 and costs, 25c.
62	Arthur Pentz.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Liverpool harbour, near Coffins island.	Fined \$3 and costs, 25c.; 4 lobster traps and 60 fathoms of mooring confiscated and destroyed.
63	Merril Pentz.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Liverpool harbour, near Coffins island.	Fined \$1.50 and costs, 25c.
64	Boardman Pentz.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Liverpool harbour, near Coffins island.	Fined \$1.50 and costs, 25c.; 4 lobster traps and 60 fathoms of mooring confiscated and destroyed.
65	Burleigh Wolfe.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Beach Meadow cove.....	Fined \$1.50 and costs, 25c.
66	Herman Wolfe.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Beach Meadow cove.....	Fined \$1.50 and costs, 25c.
67	Lorenzo Wolfe.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Beach Meadow cove.....	Fined \$1.50 and costs, 25c.; 1 lobster trap and 10 fathoms of mooring confiscated and destroyed.
68	George Wolfe.....	Violation of Sec. 4, Special Lobster Fishery Regulations.....	Beach Meadow cove.....	Fined \$1.50 and costs, 25c.

## DEPARTMENT OF FISHERIES

NOVA SCOTIA—DISTRICT No. 3—SUPERVISOR H. H. MARSHALL—Concluded

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
69	Wm. Wentzell	Violation of Sec. 4, Special Lobster Fishery Regulations.	Beach Meadow cove.	Fined \$1.50 and costs, 25c.
70	Edmund Colp	Violation of Sec. 4, Special Lobster Fishery Regulations.	Beach Meadow cove.	Fined \$1.50 and costs, 25c.
71	Lorenzo Wentzell	Violation of Sec. 4, Special Lobster Fishery Regulations.	Beach Meadow cove.	Fined \$1.50 and costs, 25c.; 2 lobster traps and 20 fathoms of mooring confiscated and destroyed.
72	Elliot Wentzell	Violation of Sec. 4, Special Lobster Fishery Regulations.	Beach Meadow cove.	Fined \$1.50 and costs, 25c.
73	Robie Wentzell	Violation of Sec. 4, Special Lobster Fishery Regulations.	Beach Meadow cove.	Fined \$1.50 and costs, 25c.
74	Maurice Wentzell	Violation of Sec. 4, Special Lobster Fishery Regulations.	Beach Meadow cove.	Fined \$1.50 and cost, 25c.
75	Timothy Ross	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
76	Sheldon Ross	Illegal lobster fishing.	Stony island, Cape Sable island	Fined \$2.
77	Gilbert Ross	Illegal lobster fishing.	Stony island, Cape Sable island	Fined \$2.
78	Charles Waybret	Illegal lobster fishing.	Stony island, Cape Sable island	Fined \$2.
79	Harry Crowell	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
80	Eddie Nickerson	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
81	Sheldon Goreham	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
82	Desmond Crowell	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
83	Herman Belliveau	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
84	Garfield Crowell	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
85	William Belliveau	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
86	Dayson Nickerson	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
87	Helston Goreham	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
88	Milton Adams	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
89	Clifford Nickerson	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
90	Jacob Devine	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
91	Osborne Goreham	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
92	Desmond Stoddart	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
93	Sylvester Goreham	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
94	Thomas L. Nickerson	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
95	Wallace Nickerson	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
96	Clifton Goreham	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
97	Lendal Nickerson	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
98	Aubrey Goodwin	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
99	Winthrop Stoddart	Illegal lobster fishing.	Wood harbour, Shelburne co.	Fined \$2.
100	Merril Williams	Violation of Sec. 4, Special Lobster Fishery Regulations.	S.W. Port Mouton	Fined \$1.
101	Sterling Roy	Violation of Sec. 4, Special Lobster Fishery Regulations.	S.W. Port Mouton	Fined \$1.

## NEW BRUNSWICK—DISTRICT No. 1—SUPERVISOR J. F. CALDER

1	Clarence Matthews.....	Driving herring with artificial lights.....	Flagg's cove, North head, Grand Manan.....	Fine of \$50 imposed and allowed to stand for future good behaviour.
2	Medford Matthews.....	Driving herring with artificial lights.....	Flagg's cove, North head, Grand Manan.....	Fine of \$50 imposed and allowed to stand for future good behaviour.
3	Arthur Babcock.....	Driving herring with artificial lights.....	Flagg's cove, North head, Grand Manan.....	Fine of \$50 imposed and allowed to stand for future good behaviour.
4	Freeman Newman.....	Driving herring with artificial lights.....	North head, Grand Manan.....	Fine of \$50 imposed and allowed to stand for future good behaviour.
5	Lowell Newman.....	Driving herring with artificial lights.....	North head, Grand Manan.....	Fine of \$50 imposed and allowed to stand for future good behaviour.
6	Norris Fletcher.....	Driving herring with artificial lights.....	North head, Grand Manan.....	Fine of \$50 imposed and allowed to stand for future good behaviour.
7	Allan Clark.....	Fishing for lobsters during close season.....	Near Partridge island, St. John co.....	Fine of \$100 or three months' imprisonment; allowed to stand.
8	Allan Clark.....	Fishing for lobsters with illegal gear, by means of hoop traps.....	Near Partridge island, St. John co.....	\$100 with costs or three months imprisonment; allowed to stand.
9	Arthur Scott.....	Fishing for lobsters during close season.....	Near Partridge island, St. John co.....	\$100 with costs, or three months imprisonment; allowed to stand.
10	Arthur Scott.....	Fishing for lobsters with illegal gear—hoop traps.....	Near Partridge island, St. John co.....	\$100 with costs, or three months imprisonment; allowed to stand.
11	John Williams.....	Fishing for lobsters during close season.....	Near Partridge island, St. John co.....	\$100 with costs, or three months imprisonment; allowed to stand.
12	John Williams.....	Fishing for lobsters with illegal gear—hoop traps.....	Near Partridge island, St. John co.....	\$100 fine imposed with costs, or three months imprisonment; allowed to stand.
13	Fred Cullen.....	Fishing for lobsters during close season.....	Near Partridge island, St. John co.....	\$100 with costs, or three months imprisonment; allowed to stand.
14	Fred Cullen.....	Fishing for lobsters with illegal gear, hoop traps.....	Near Partridge island, St. John co.....	\$100 with costs, or three months' imprisonment; allowed to stand.
15	Stewart McLeod.....	Illegally fishing for salmon.....	St. George fishway.....	Fine of \$100 imposed and allowed to stand for future good behaviour.
16	Charles Lord.....	Illegally fishing for lobsters.....	West Isles, Char. co.....	Fine of \$50 imposed; allowed to stand for two years.

## NEW BRUNSWICK—DISTRICT No. 2—SUPERVISOR A. L. BARRY

1	Roger Thibideau and Ambrose Martin.....	Fishing for lobsters in close season.....	Miramichi bay.....	Fined \$5 each and costs, \$4.50 each.
2	Allan Mills.....	Drifting across statutory drift-line.....	Miramichi bay.....	Fined \$10 and costs, \$11.10.
3	Jack Williston.....	Drifting across statutory drift-line.....	Miramichi bay.....	Fined \$10 and costs, \$44.60.
4	Clay Williston.....	Drifting across statutory drift-line.....	Miramichi bay.....	Fined \$10 and costs, \$11.10.
5	Raymond Manuel.....	Drifting across statutory drift-line.....	Miramichi bay.....	Fined \$10 and costs, \$11.10.
6	George Helman.....	Drifting across statutory drift-line.....	Miramichi bay.....	Fined \$10 and costs, \$11.10.
7	Ernest MacDonald.....	Failure to properly tie up salmon trapnets.....	Pt. au Cart.....	Fined \$2 and costs, \$7.75.



## DEPARTMENT OF FISHERIES

NEW BRUNSWICK—DISTRICT No. 2—Continued

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
8	Harry Helman.....	Drifting over statutory line.....	Miramichi bay.....	Fined \$5 and costs, \$3.50.
9	William G. Manuel.....	Drifting over statutory line.....	Miramichi bay.....	Fined \$5 and costs, \$3.50.
10	Sam Mauzeroll.....	Drifting over statutory line.....	Miramichi bay.....	Fined \$3 and costs, \$3.50.
11	John Mauzeroll.....	Drifting over statutory line.....	Miramichi bay.....	Fined \$10 and costs, \$3.50.
12	Fred Martin.....	Drifting over statutory line.....	Miramichi bay.....	Fined \$10 and costs, \$3.50.
13	Wilfred Butler.....	Drifting over statutory line.....	Miramichi bay.....	Fined \$5 and costs, \$3.50.
14	Everett Williston.....	Drifting over statutory line.....	Miramichi bay.....	Fined \$5 and costs, \$3.50.
15	Leonard Lewis.....	Drifting over statutory line.....	Miramichi bay.....	Fined \$10 and costs, \$3.50.
16	Vital Collette.....	Having oysters in possession during close season.....	Buctouche.....	Fined \$5 or 2 months jail; \$3.50 costs.
17	Norman Mills.....	Drifting for salmon in close season.....	Miramichi bay.....	Fined \$3 and costs, \$3.50.
18	Jack Williston.....	Drifting for salmon in close season.....	Miramichi bay.....	Case dismissed.
19	William Manuel.....	Drifting for salmon in close season.....	Miramichi bay.....	Not guilty.
20	Allan Mills.....	Drifting for salmon in close season.....	Miramichi bay.....	Case withdrawn.
21	George Mauzeroll.....	Drifting for salmon in close season.....	Miramichi bay.....	Not guilty.
22	Harry Helman.....	Drifting for salmon in close season.....	Miramichi bay.....	Not guilty.
23	George Helman.....	Drifting for salmon in close season.....	Miramichi bay.....	Not guilty.
24	Wilfred Manuel.....	Drifting for salmon in close season.....	Miramichi bay.....	Not guilty.
25	Bernard Bowie.....	Failure to observe weekly close period.....	The Willows.....	Not guilty.
26	Abraham Asoyuf.....	Drifting for salmon inside statutory line.....	Miramichi bay.....	Fined \$5 and costs, \$3.50 costs.
27	Joseph Savoy.....	Drifting for salmon inside statutory line.....	Miramichi bay.....	Fined \$5 and costs, \$4.05.
28	Conard Williston.....	Drifting for salmon inside statutory line.....	Miramichi bay.....	\$5 and costs, \$4.05.
29	Frank Landry.....	Drifting for salmon inside statutory line.....	Miramichi bay.....	Fined \$5 and costs, \$4.05.
30	Austin Williston.....	Drifting for salmon inside statutory line.....	Miramichi bay.....	Fined \$5 and costs, \$4.05.
31	Jeffrey Richard.....	Drifting for salmon inside statutory line.....	Miramichi bay.....	Fined \$5 and costs, \$4.05.
32	Clarence Jimmo.....	Drifting for salmon inside statutory line.....	Miramichi bay.....	Fined \$5 and costs, \$4.05.
33	C��ard Arsenau.....	Drifting for salmon inside statutory line.....	Miramichi bay.....	Fined \$5 and costs, \$4.05.
34	Albert Bastarache.....	Fishing for lobsters without licence.....	Northernberland strait.....	Fined \$1 and costs, \$4.05.
35	James Cormier.....	Fishing for lobsters without licence.....	Northernberland strait.....	Fined \$1 and costs \$1.00.
36	Harry King.....	Fishing for salmon during two weeks close time.....	Northernberland strait.....	Fined \$1 and costs \$1.
37	S��bastien Chiasson.....	Fishing for and having in possession lobsters in close season.....	Miramichi river.....	Not guilty.
38	Emile Roussel.....	Fishing for and having in possession lobsters in close season.....	Shippegan gully.....	Fined \$25 or 2 months in jail.
39	Albini Hache.....	Fishing for and having in possession lobsters in close season.....	Shippegan gully.....	Fined \$25 or 2 months in jail.
40	Abby Duquay.....	Fishing for and having in possession lobsters in close season.....	Shippegan gully.....	Fined \$25 or 2 months in jail.
41	Ad��lard Lanteigne.....	Having in possession and failing to liberate berried lobsters.....	Island river.....	Fined \$25 or 2 months in jail.
42	Lionel Mills.....	Fishing for lobsters without licence.....	Buctouche bay.....	Fined \$50 or 3 months in jail.
43	Emanuel LeBlanc.....	Fishing for lobsters without licence.....	Ste. Croix.....	Fined \$2 and costs, \$1.
44	Mennel Allen.....	Leaving shore for lobster fishing grounds with gear.....	Cape Tormentine.....	Fined \$10 and \$1 costs or 30 days in jail.

45	Hartman Allen.....	Leaving shore for lobster fishing grounds with gear	Cape Tormentine.....	Fined \$1 and costs, \$3.50.
46	Yvon Gallant.....	Fishing for lobsters without licence.....	Bourgeois office.....	Fined \$2 and costs, \$1.
47	Frank C. Vibert.....	Having in possession lobsters in close season.....	Miscou point.....	Not guilty.
48	Robert Vibert.....	Having in possession lobsters in close season.....	Miscou point.....	Not guilty.
49	Reginald Dove.....	Engaged in fishing without a licence.....	Cape Tormentine.....	Not guilty.
50	Parker Allen.....	Engaged in fishing without a licence.....	Cape Tormentine.....	Not guilty.
51	Ray Allen.....	Engaged in fishing without a licence.....	Cape Tormentine.....	Not guilty.
52	Charles Stright.....	Engaged in fishing without a licence.....	Murray corner.....	Not guilty.
53	Stewart Fenton.....	Fishing for salmon in close season.....	Miramichi river.....	Fined \$50 and 2 months in jail.
54	Aldérie LeBlanc.....	Having in possession lobsters in close season.....	Rielibucto.....	Fined \$25 and costs, \$5.50.
55	Frank C. Vibert.....	Failing to liberate berried lobsters.....	Miscou harbour.....	Case withdrawn.
56	Lescil Vibert.....	Failing to liberate berried lobsters.....	Miscou harbour.....	Case withdrawn.
57	Howard Vibert.....	Having in possession berried lobsters.....	Miscou harbour.....	Fined \$1 and costs, \$4.
58	Sephirim LeBlanc.....	Fishing for and having in possession lobsters in close season.....	Four roads.....	Fined \$25 or 2 months in jail.
59	Chris Olsen.....	Having lobsters in possession contrary to Sec. 7, Lobster Fishery Regulations.....	Jacquet river.....	Fined \$50 or 40 days jail, and costs \$12.05. Had delivery car confiscated.
60	Alex. C. Chiasson.....	Failing to liberate berried lobsters.....	Island river.....	Not guilty.
61	Louis L. Gauthier.....	Having in possession lobsters in close season.....	Miscou point.....	\$50 or 3 months in jail, and costs, \$29.40.
62	Stimlan Ward.....	Having in possession lobsters in close season.....	Miscou point.....	\$50 or 3 months in jail, and costs, \$29.40.
63	John Sylva.....	Having in possession lobsters in close season.....	Miscou point.....	\$50 or 3 months in jail, and costs, \$29.40.
64	Orvila Brideau.....	Having in possession lobsters in close season.....	Island river.....	Fined \$25 or 2 months, and costs, \$20.60.
65	Hugh Cowan.....	Having in possession lobsters in close season.....	Island river.....	Fined \$25 or 2 months and costs, \$20.60.
66	Lee Gouzen.....	Having berried lobsters in possession.....	Locague.....	Fined \$5 and costs, \$3.50.
67	Perley Bannister.....	Having in possession lobsters, close season.....	Northumberland strait.....	Fined \$25 and costs, \$6.50.
68	Joseph Hébert.....	Having in possession lobsters, close season.....	Northumberland strait.....	Fined \$25 and costs, \$6.50.
69	Robert Firlotte.....	Fishing for lobsters illegally.....	Jacquet river.....	Given 6 months suspended sentence.
69 A	Orvila Gauvin.....	Having in possession lobsters in close season.....	Shippegan island.....	Fined \$15 and \$5.50 costs.
69 B	Wilfred Gionet.....	Fishing for lobsters in close season.....	Pigeon hill.....	Case withdrawn on advice of department's counsel.
70	Abel Fagan.....	Fishing lobsters without licence.....	Little cape.....	Fined \$5 and costs, \$4.05.
71	Patrick C. Legere.....	Fishing lobsters without licence.....	Little cape.....	Fined \$5 or 10 days in jail, went to jail.
72	Albert Thibodeau.....	Having in his possession lobsters.....	Rielibucto village.....	Fined \$25 or 1 month in jail, went to jail.
73	Emile Thibodeau.....	Having in his possession lobsters.....	Rielibucto cape.....	Fined \$25 or 1 month. Paid fine in 1 month.
74	Eugène Gauvin.....	Fishing for lobsters in close season.....	Pigeon hill.....	Not guilty.
75	Pat Gionet.....	Fishing for lobsters in close season.....	Pigeon hill.....	Not guilty.
76	Alexandre Larocque.....	Fishing for lobsters in close season.....	Pigeon hill.....	Not guilty.
77	Jos. S. Larocque.....	Fishing for lobsters in close season.....	Pigeon hill.....	Not guilty.
78	Philip Larocque.....	Fishing for lobsters in close season.....	Pigeon hill.....	Not guilty.
79	Lazare Gionet and André Larocque.....	Fishing for lobsters in close season.....	Pigeon Hill.....	Case withdrawn.
80	James J. Finn.....	Fishing for smelts with bag-nets.....	Pokemouche river.....	Fined \$25 or 2 months in jail.
81	Stanislas J. Finn.....	Fishing for smelts with bag-nets in close season.....	Pokemouche river.....	Fined \$25.
82	Cuy Arsenault.....	Fishing for smelts with bag-nets in close season.....	Pokemouche river.....	Fined \$25.
83	James Nardini.....	Fishing for smelts with bag-nets in close season.....	Pokemouche river.....	Fined \$25.
84	Azade Power.....	Fishing for smelts with bag-nets in close season.....	Pokemouche river.....	Fined \$25.
85	Arthur Power.....	Fishing for smelts with bag-nets in close season.....	Pokemouche river.....	Fined \$25.
86	Adlard Savoy.....	Having in possession lobsters in close season.....	Shippegan island.....	Fined \$10.
87	Léo Lantegne.....	Having in possession lobsters in close season.....	Island river.....	Fined \$10.

NEW BRUNSWICK—DISTRICT No. 2—SUPERVISOR L. H. PARKS—*Concluded*

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
88	Alex. Ward.....	Having in possession and failing to liberate berried lobsters.	Miscou Centre.....	Fined \$10.
89	Jos. P. Lanteigne.....	Having in possession lobsters in close season.	Island river.....	Fined \$10 or 1 month in jail.
90	Jos. Robichaud.....	Having in possession lobsters in close season.	Shiheapan island.....	Fined \$10.
91	Barney Beaudin.....	Having in possession lobsters in close season.	Wilson's point.....	Fined \$10 or 3 months in jail.
92	James Lanteigne.....	Having in possession and failing to liberate berried lobsters.	Miscou centre.....	Fined \$1.
93	Romain Bizeau.....	Having in possession and failing to liberate berried lobsters.	Miscou centre.....	Fined \$1.
94	William Vibert.....	Having in possession and failing to liberate berried lobsters.	Miscou centre.....	Fined \$1.
95	Mick Ward.....	Having in possession and failing to liberate berried lobsters.	Miscou centre.....	Fined \$1.
96	Donat Babineau.....	Having in possession lobsters in close season.	Northumberland Strait off Point Sapin.....	Fined \$25.
97	Eddy Boucher.....	Having in possession lobsters in close season.	Little Chockpish.....	Fined \$25.
98	Ovila Boucher.....	Having in possession lobsters in close season.	Little Chockpish.....	Fined \$25.
99	Thos. St.-Pierre.....	Fishing and retaining undersize oysters.	Cocagne.....	Fined \$8.
100	John C. Larocque.....	Having in possession lobsters in close season.	Cape Bateau.....	Fined \$25.
101	John Metcalick.....	Having in possession illegally caught lobsters.	Burnt Church.....	Fined \$10.
102	Memel Allen.....	Obstructing officer in discharge of duties.	Cape Tormentine.....	Not guilty.
103	Bernard Williston.....	Having undersized oysters in his possession.	Bay du Vin.....	Fined \$1.
104	Edward King.....	Setting and fishing for smelts with box-net in close season.	St. Edward.....	Fined \$1.
105	Martin Cormier.....	Having retained one bucket of undersized oysters.	Grand Anse.....	Fined \$25. Suspended.
106	Jean Louis Cormier.....	Having retained one bucket of undersized oysters.	Ste. Anne du Boage.....	Fined \$25. Suspended.
107	Prospré Poirier.....	Having retained one bucket of undersized oysters.	Ste. Jeanne d'Arc.....	Fined \$25. Suspended.
108	Romain Poirier.....	Having retained one bucket of undersized oysters.	Ste. Jeanne d'Arc.....	Fined \$25. Suspended.
109	James Scott.....	Having in possession smelts in close season.	Lower Newcastle.....	Fined \$5.
110	Georges J. Robichaud.....	Violation of Fishery Regs. and Act. contrary to Sect. 7.	Laneque.....	Fined \$200.
111	Maxime Bourque.....	Marketing undersized oysters.	Shediac Bridge.....	Fined \$5.
112	Benson McLeod.....	Having in possession undersized oysters.	Tabusintac.....	Fined \$1.
113	Prime Robichaud.....	Obstructing officers in discharge of his duties.	Little Pokemouche.....	Fined \$100.

## NEW BRUNSWICK—DISTRICT No. 3—SUPERVISOR L. H. PARKS

1	James R. Tomilson.....	Water pollution by sawdust.....	Tay Stream, tributary of Nashwaak, York co.	Fined \$20, and costs \$7.40.
2	Allan McLaughlin, Jr.....	Fishing for shad during close season.	St. John river, Victoria co.....	Fined \$10, and costs \$3.25.
3	Edward Michaud.....	Fishing for shad during close season.	St. John river, Victoria co.....	Fined \$10, and costs \$3.25.
4	Thomas Lorraine.....	Fishing salmon trap-net during weekly close time.	N.W. Miramichi river, Northumberland co.	Fined \$2, and costs \$4.



5	Arnold Adams.....	Fishing salmon trap-net during weekly close time..	N.W. Miramichi river, North-umberland co. Fined \$2, and costs \$4.
6	Frank McKenzie.....	Fishing salmon trap-net during weekly close time..	N.W. Miramichi river, North-umberland co. Fined \$2, and costs \$4.
7	Harold Jordan.....	Fishing salmon trap-net during weekly close time..	N.W. Miramichi river, North-umberland co. Fined \$2, and costs \$4.
8	John McColm.....	Fishing salmon trap-net during weekly close time..	N.W. Miramichi river, North-umberland co. Fined \$2, and costs \$4.
9	Ernest Goodfellow.....	Fishing salmon trap-net during weekly close time..	N.W. Miramichi river, North-umberland co. Fined \$2, and costs \$4.
10	Michael Young.....	Failed to lift salmon net at proper time.....	N.W. Miramichi river, North-umberland co. Fined \$2, and costs \$4.
11	A. F. Colwell.....	Water pollution.....	Cumberland bay stream, Queens co. Case withdrawn on advice of Department Aug. 9, 1934; costs, \$6.85, paid by prosecution.
12	Emile Albert.....	Having lobsters in his possession during close season	Parish of St. Hilaire, Madawaska co. Case dismissed for want of evidence; cost, \$3.85, paid by prosecution.
13	Arthur Albert.....	Having lobsters in his possession during close season	Parish of St. Hilaire, Madawaska co. Case dismissed for want of evidence; costs \$1.85 paid by prosecution.
14	Léo Albert.....	Having lobsters in his possession during close season	Parish of St. Hilaire, Madawaska co. Case dismissed for want of evidence; costs, \$1.85, paid by prosecution.
15	James Lynch.....	Fishing for gaspereau during weekly close period...	S.W. Miramichi river, North-umberland co. Fined \$1, and costs \$7.65.
16	Beverley Sturgeon.....	Fishing for salmon during close season.....	S.W. Miramichi river, North-umberland co. Fined \$25 suspended; costs \$5, paid by defendant.
17	Albert Collin.....	Fishing for trout without a permit.....	Baker lake, Madawaska co. Fined \$25 suspended; costs, \$5, paid by defendant.
18	Denis S. Martin.....	Transporting illegally caught trout into Maine.....	From Baker lake, N.B., to Port Kent, Maine. Fined \$25 suspended; costs, \$5, paid by defendant.
19	Howard Lyons.....	Fishing gaspereau net during weekly close season...	S.W. Miramichi river (non-tidal) Northumberland co. Fined \$1, and costs \$1, paid by defendant.

## PRINCE EDWARD ISLAND—SUPERVISOR S. T. GALLANT

1	Ernest Essory.....	Fishing trout close season.....	Milton stream..... \$1 and costs or 1 month in jail, paid.
2	Ralph Riggs.....	Fishing trout close season.....	Milton stream..... \$1 and costs or 1 month in jail, paid.
3	Reginald Bell.....	Fishing trout close season.....	Milton stream..... Acquitted.
4	Vernon McIntyre.....	Fishing trout close season.....	Milton stream..... Acquitted.
5	Richard Shinnons.....	Possession quahaugs close season.....	Summerside..... \$5 and costs, paid.
6	Adolphus Cheverie.....	Fishing snelts without a licence.....	Souris bay..... \$1 and costs, paid.
7	Wm. Geldert.....	Leaving shore for lobster fishing grounds before appointed time.....	St. Peters harbour..... \$1 and costs, paid.
8	Alban McAdam.....	Leaving shore for lobster fishing grounds before appointed time.....	St. Peters harbour..... \$5 and costs, paid.
9	Ernest Baker.....	Leaving shore for lobster fishing grounds before appointed time.....	St. Peters harbour..... \$5 and costs, paid.

PRINCE EDWARD ISLAND—SUPERVISOR S. T. GALLANT—*Concluded*

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
10	Stewart Mosher.....	Leaving shore for lobster fishing grounds before appointed time.	St. Peters harbour.....	Acquitted.
11	Sébinus Johnston.....	Fishing smelts close season.....	Dunk river.....	\$25 and costs, paid.
12	James Gan.....	Possession of lobsters close season.....	Lot 11.....	\$20 and costs, paid.
13	Henry Rogerson.....	Fishing lobsters without a licence.....	Victoria.....	\$10 and costs, paid.
14	John Knox.....	Fishing lobsters without a licence.....	Victoria.....	\$10 and costs, paid.
15	Arthur Simmons.....	Fishing lobsters in close season.....	Richmond bay.....	\$20 and costs, paid.
16	Kenneth Boulter.....	Having been found in lobster fishing boat without a licence.	Tryon.....	\$5, paid.
17	Leovitt Kenny.....	Having lobsters in possession in close season.....	Black marsh.....	\$50 and costs, or 3 months in jail, left province, warrant to be executed on return.
18	Robert Gallant.....	Possession of lobsters close season.....	Nail pond.....	\$50 and costs, or 3 months in jail, warrant to be executed in June.
19	Carl O'Halloran.....	Possession of lobsters close season.....	Cape Wolfe.....	\$50 and costs, or 3 months in jail, paid.
20	Solomon Winters.....	Possession of lobsters close season.....	Tignish.....	\$50 and costs, or 3 months in jail, warrant to be executed in June, 1935.
21	Orville Dalton.....	Possession of lobsters close season.....	Burton.....	\$50 and costs or 3 months in jail, paid.
22	Chas. Corkrum.....	Fishing lobsters without a licence.....	West point.....	\$10 and costs or 30 days in jail, paid.
23	Jas. D. McDonald.....	Fishing lobsters without a licence.....	Rockbarra.....	\$5 and costs, paid.
24	Eddie Pope.....	Fishing lobsters without a licence.....	Rockbarra.....	\$5 and costs, paid.
25	Stephen Mellick.....	Fishing lobsters without a licence.....	North lake.....	\$5 and costs, paid.
26	Henry Arsenault.....	Catching and retaining berried lobsters.....	St. Chrysostôme.....	Acquitted.
27	Willie Arsenault.....	Fishing lobsters without a licence.....	Egmont bay.....	Acquitted.
28	Sylvière Arsenault.....	Fishing lobsters without a licence.....	St. Chrysostôme.....	\$1, suspended sentence.
29	Jos. A. Gallant.....	Fishing lobsters without a licence.....	Northumberland Strait.....	Acquitted.
30	Emanuel F. Arsenault.....	Having berried lobsters in possession.....	St. Chrysostôme.....	Acquitted.
31	John Des Roches.....	Fishing lobsters without a licence.....	St. Chrysostôme.....	\$1 and costs, given until June to pay.
32	Edmund Culicuit.....	Fishing lobsters without a licence.....	West point.....	\$10 and costs or 30 days in jail, served jail sentence.
33	Burke Rielly.....	Fishing lobsters without a licence.....	West point.....	\$10 and costs or 30 days, served jail sentence.
34	Glen Shaw.....	Fishing lobsters without a licence.....	West point.....	\$10 and costs or 30 days, warrant to be executed in June.
35	Earl McWilliams.....	Fishing lobsters without a licence.....	West point.....	\$10 and costs or 30 days, warrant to be executed in June.
36	Redmond Rielly.....	Fishing lobsters without a licence.....	West point.....	\$10 and costs or 30 days, served jail sentence.
37	Curtis Dymont.....	Fishing lobsters without a licence.....	West point.....	Acquitted.
38	Herbert McCormick.....	Fishing lobsters without a licence.....	West point.....	Acquitted.
39	Robert Hartz.....	Fishing lobsters without a licence.....	West point.....	Acquitted.
40	Guy Hartz.....	Fishing lobsters without a licence.....	West point.....	Acquitted.

41	Victor Cook.....	Fishing lobsters without a licence.....	West point.....	Acquitted.
42	Emanuel Myers.....	Possession of lobsters in close season.....	Nail pond.....	\$50 and costs or 3 months, warrant to be executed in June.
43	Andrew Butler.....	Fishing oysters in close season.....	Fullerton's creek.....	\$1, paid.
44	Calvin Darrach.....	Fishing oysters in close season.....	Clyde river.....	\$6, paid.
45	Ivan Darrach.....	Fishing oysters in close season.....	Clyde river.....	\$5, paid.
46	Chas. Gallant.....	Having lobsters in possession in close season.....	Alberton.....	\$50 and costs or 3 months, penalty remitted by Minister.
47	Sydney Birch.....	Possession of oysters in close season.....	Southwest, Lot 16.....	\$1, paid.
48	Michael Thomas.....	Having small oysters in possession in close season.....	Duffy's point.....	\$1, paid.
49	Wilfred Lawton.....	Having oysters in possession contrary to regulations.....	Charlottetown.....	\$6, paid.
50	Alex LeClair.....	Having oysters in possession contrary to regulations.....	Charlottetown.....	\$5, paid.
51	Luther Hubley.....	Fishing smelts on Sunday with bag-nets.....	Pinette river.....	\$2, paid.
52	Frederick Hubley.....	Fishing smelts on Sunday with bag-nets.....	Pinette river.....	\$2, paid.
53	Daniel Cantello.....	Fishing smelts on Sunday with bag-nets.....	Pinette river.....	\$2, paid.

BRITISH COLUMBIA—CHIEF SUPERVISOR, MAJOR J. A. MOTHERWELL  
DISTRICT No. 1—SUPERVISOR R. W. MACLEOD

1	Robert Urquhart.....	In possession ling cod during closed season.....	Vancouver.....	Fined \$20 and costs.
2	Wong Fong.....	Violation Sec. 5, s.s. 1 and 2, Fishery Regulations.....	Vancouver.....	Suspended sentence and 37 small crabs confiscated.
3	H. Nishimura.....	In possession bluebacks during closed season.....	Vancouver.....	Fined \$10 and costs and 6 blueback salmon confiscated.
4	N. Evans.....	Fishing for trout during closed season.....	Okanagan lake.....	Fined \$5 and costs and fishing gear confiscated.
5	H. Ibbertson.....	Fishing for trout during closed season.....	Okanagan lake.....	Fined \$5 and costs and fishing gear confiscated.
6	G. Athens.....	In possession bluebacks during closed season.....	Vancouver.....	Fined \$10 and costs.
7	K. Yamamoto.....	In possession bluebacks during closed season.....	Vancouver.....	Fined \$10 and costs and 5 blueback salmon confiscated.
8	P. Dennett.....	In possession bluebacks during closed season.....	Vancouver.....	Fined \$10 and costs and 6 blueback salmon confiscated.
9	Joe Ogenski.....	Violation Sec. 1, s.s. 15a Fishery Regulations.....	Salmon river.....	Fined \$5 and costs and fishing gear confiscated.
10	John Budvesel.....	Violation Sec. 1, s.s. 15a Fishery Regulations.....	Salmon river.....	Fined \$5 and costs and fishing gear confiscated.
11	John Perechy.....	Catching and in possession small trout.....	Upper Sumas river.....	Fined \$5 and costs.
12	John Kovace.....	Catching and in possession small trout.....	Upper Sumas river.....	Fined \$5 and costs and 5 small trout confiscated.
13	Paul James.....	Violation Sec. 11, s.s. (b) Fishery Regulations.....	Fraser river.....	Suspended sentence, and gill-net confiscated.
14	Gordon James.....	Violation Sec. 11, s.s. 2, Fishery Regulations.....	Fraser river.....	Fined \$2.50 and costs and 9 sockeye salmon confiscated.
15	R. W. Shrum.....	Violation Sec. 1, s.s. 6, Fishery Regulations.....	Porcupine creek.....	Fined \$5 and costs and fishing tackle confiscated.



BRITISH COLUMBIA—DISTRICT No. 1—*Concluded*

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
16	W. Baltzo.....	Violation Sec. 1, s.s. 7, Fishery Regulations.....	Seymour river.....	Fined \$2.50 and costs and 3 bottles salmon eggs confiscated.
17	W. Baltzo.....	Violation Sec. 13, s.s. d, Fishery Regulations.....	Seymour river.....	Suspended sentence.
18	Henry Carlson.....	Violation sec. 1, s.s. 7, Fishery Regulations.....	Seymour river.....	Fined \$2.50 and costs, and 1 bottle salmon eggs confiscated.
19	S. Kamiya.....	Violation Sec. 18, s.s. 8, Fishery Regulations.....	Spanish Banks.....	Fined \$5 and costs and smelts confiscated.
20	K. Kuboniwa.....	Violation Sec. 18, s.s. 8, Fishery Regulations.....	Spanish Banks.....	Fined \$5 and costs and smelts confiscated.
21	S. Sato.....	Violation Sec. 18, s.s. 8, Fishery Regulations.....	Spanish Banks.....	Fined \$5 and costs and smelts confiscated.
22	George Wong.....	Violation Sec. 11, s.s. 3d Fishery Regulations.....	Mission.....	Fined \$25 and costs and 320 pounds sturgeon confiscated.
23	Harry Joseph.....	Violation Sec. 11, s.s. 2, Fishery Regulations.....	Mission.....	Fined \$25; one month gaol served in lieu.
24	Harry Joseph.....	Violation Sec. 39, Fisheries Act.....	Mission.....	Fined \$100; three months' gaol served in lieu.
25	Willie Mussell.....	Violation Sec. 39, Fisheries Act.....	Mission.....	Fined \$100; three months' gaol served in lieu.
26	Tom Borevich.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$50 and costs and 926 salmon confiscated.
27	S. Kanno.....	Violation Sec. 1, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$35 and costs.
28	Lobi.....	In possession undersized sturgeon.....	New Westminster.....	Fined \$1.
29	Sylvester Campbell.....	Violation Sec. 19, s.s. 2b, Fishery Regulations.....	Seymour river.....	Fined \$5 and net confiscated.
30	Albert Julian.....	Violation Sec. 19, s.s. 2b, Fishery Regulations.....	Seymour river.....	Fined \$5 and net confiscated.
31	F. Takeuchi.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$37.50 and costs.
32	J. Hirota.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$37.50 and costs.
33	I. Tabata.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$37.50 and costs.
34	Minoru Hamaguchi.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$37.50 and costs and salmon confiscated.
35	Tamejiro Nakanishi.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$37.50 and costs and salmon confiscated.
36	Yoshio Kawano.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$1 and costs.
37	M. Hamaguchi.....	Violation Sec. 20, s.s. 2, Fishery Regulations.....	Fraser river.....	Fined \$12.50 and costs and 1 small sturgeon confiscated.
38	R. Nakagawa.....	Violation Sec. 20, s.s. 2, Fishery Regulations.....	Fraser river.....	Fined \$12.50 and costs and 1 small sturgeon confiscated.
39	Takeo Nakata.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$1 and costs.
40	Kenji Nakata.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$1 and costs.
41	Jum Hama.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$1 and costs.
42	F. Hayashi.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$10 and costs.
43	Y. Mashimoto.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$25 and costs.
44	Maso Yamamoto.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$25 and costs.

45	S. Hashimoto.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$25 and costs and 30 salmon confiscated.
46	Bob Joe.....	Violation Sec. 20, s.s. 1, Fishery Regulations.....	Fraser river.....	Fined \$2.50 and costs.
47	N. Windsor.....	Violation Sec. 22, s.s. 1, Fishery Regulations.....	Fraser river.....	Fined \$10 and salmon confiscated.
48	S. Sasaki.....	Violation Sec. 16, s.s. 5, Fishery Regulations.....	Fraser river.....	Fined \$10 and costs and salmon confiscated.
49	J. W. Johnson.....	Violation Sec. 16, s.s. 16a, Fishery Regulations.....	Squamish river.....	Fined \$10 and costs.
50	I. Miyashita.....	Violation Sec. 20, s.s. 2, Fishery Regulations.....	Steveston.....	Fined \$12.50 and costs and 2 small sturgeon confiscated.
51	John Smith.....	Violation Sec. 11, s.s. 1, Fishery Regulations.....	Fraser river.....	Fined \$10 and costs.
52	Robert Smith.....	Violation Sec. 16, s.s. 2, Fishery Regulations.....	Fraser river.....	Fined \$10 and costs and salmon confiscated.
53	Senataro Omoto.....	Violation Sec. 16, s.s. 2, Fishery Regulations.....	Howe Sound.....	Fined \$10 and costs and 16 salmon confiscated.
54	Dan Johnson.....	Violation Sec. 16, s.s. 16a, Fishery Regulations.....	Indian river.....	Fined \$10 and costs and 35 salmon confiscated.
55	Alfred Remmen.....	Violation Sec. 16, s.s. 10a, Fishery Regulations.....	Indian river.....	Fined \$10 and costs.
56	Joseph Cathcart.....	Violation Sec. 16, s.s. a, Fishery Regulations.....	Fraser river.....	Fined \$7.50 and costs and gill-net confiscated.

## DISTRICT No. 2—SUPERVISOR J. BOYD

1	Harold Selfjord.....	Violation Sec. 19, s.s. 7a, Fishery Regulations.....	Langaga island.....	Fined \$5.
2	Ora Hornbrook.....	Fishing during weekly closed season.....	Rivers inlet.....	Fined \$10.
3	Jeffrey Wallace.....	Fishing during weekly closed season.....	Rivers inlet.....	Fined \$10.
4	P. K. Lervik.....	Fishing during weekly closed season.....	Rivers inlet.....	Fined \$10.
5	D. Assu.....	Fishing during weekly closed season.....	Rivers inlet.....	Fined \$10.
6	L. Hurst.....	Fishing without a licence.....	Rivers inlet.....	Fined \$10.
7	A. Hubert.....	Fishing during weekly closed season.....	Rivers inlet.....	Fined \$10.
8	Tom Paul.....	Fishing inside boundary.....	Rivers inlet.....	Fined \$25.
9	Toshichi Miki.....	Fishing inside boundary.....	Rivers inlet.....	Fined \$25.
10	A. McDonald.....	Fishing inside boundary.....	Rivers inlet.....	Fined \$25.
11	Josip Car.....	Fishing during weekly closed season.....	Rivers inlet.....	Fined \$75 and gas boat, net and 21 salmon confiscated.
12	A. M. Anderson.....	Fishing without a licence.....	Rivers inlet.....	Fined \$10.
13	Cus Lindgren.....	Fishing with oversize net.....	Rivers inlet.....	Fined \$25, and piece of net confiscated.
14	Wesley Oja.....	Fishing inside boundary.....	Rivers inlet.....	Case dismissed.
15	Ernest Dean.....	Fishing during weekly closed season.....	Rivers inlet.....	Case dismissed.
16	Paul Weena.....	Fishing inside boundary.....	Rivers inlet.....	Fined \$25, 15 days gaol served in lieu.
17	Paul Weena.....	Resisting a fishery officer.....	Rivers inlet.....	Case dismissed.
18	T. Kawasaki.....	Fishing without a licence.....	Middle passage.....	Fined \$10 and costs.
19	G. Oliver.....	Fishing during weekly closed season.....	Chatham sound.....	Fined \$15 and costs.
20	E. Stacie.....	Fishing during weekly closed season.....	Chatham sound.....	Fined \$15 and costs.
21	Jirokiichi Arimoto.....	Fishing during weekly closed season.....	Chatham sound.....	Fined \$15 and costs.
22	Johan Petersen.....	Fishing inside boundary.....	Rivers inlet.....	Fined \$25 and 1 salmon confiscated.
23	J. J. Duffy.....	Fishing inside boundary.....	Rivers inlet.....	Fined \$25 and 1 sockeye salmon confiscated.

## DEPARTMENT OF FISHERIES

## BRITISH COLUMBIA—DISTRICT No. 2—Concluded

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
24	D. McLeod.....	Fishing inside boundary.....	Rivers inlet.....	Case dismissed.
25	Karl Johanson.....	Violation Sec. 19, s.s. 7a, Fishery Regulations.....	Langara island.....	Fined \$10 and costs.
26	Gene Bruns.....	Fishing salmon above boundary.....	Skeena river.....	Suspended sentence and boat, net and 47 salmon confiscated.
27	William Rudland.....	In possession salmon illegally.....	Kumaleon inlet.....	Fined \$20 and costs, and 200 salmon confiscated.
28	Slavko Car.....	Fishing inside boundary.....	Kitkatla bay.....	Fined \$65 and costs.
29	Nathan Shaw.....	Fishing inside boundary.....	Turtle Pt. creek.....	Fined \$20 and costs.
30	Toshimitsu Otomo.....	Fishing inside boundary.....	Crab harbour.....	Fined \$50 and costs.
31	Jinosuke Ide.....	Fishing inside boundary.....	Crab harbour.....	Fined \$50 and costs.
32	Imatara Matsuka.....	Fishing inside boundary.....	Crab harbour.....	Fined \$50 and costs and 31 salmon confiscated.
33	John Vukovich.....	Fishing inside boundary.....	Gullchuck creek.....	Fined \$20 and costs and 30 salmon confiscated.
34	Earl Edwards.....	Fishing inside boundary.....	N. Bentinck arm.....	Fined \$10.
35	Victor Wangberg.....	Fishing inside boundary.....	N. Bentinck arm.....	Fined \$10.
36	Wm. Cooper.....	Fishing inside boundary.....	N. Bentinck arm.....	Fined \$10.
37	Melvin Nygaard.....	Fishing inside boundary.....	N. Bentinck arm.....	Fined \$10.
38	K. Shiogi.....	Fishing without a licence.....	Rivers inlet.....	Fined \$100 and 13 salmon confiscated.
39	George Cunningham.....	Fishing above boundary.....	Skeena river.....	Fined \$25 and costs.
40	Henry McKay.....	Fishing above boundary.....	McKay creek.....	Fined \$65 and 797 salmon confiscated.
41	Vincent Williams.....	Fishing with long gill-net.....	Rocky bay.....	Case dismissed.
42	Fred Kohse.....	Fishing with long gill-net.....	Rocky bay.....	Case dismissed.
43	Ralph Clayton.....	Bring salmon from above commercial boundary.....	Naas river.....	Fined \$15 and costs and boat net and 76 salmon confiscated.
44	Rufus Watts.....	Bring salmon from above commercial boundary.....	Naas river.....	Fined \$25 and costs, and boat net and 18 salmon confiscated.
45	Joe Bush.....	Obstructing a fishery officer.....	Naas river.....	Fined \$25 and costs.
46	Gregory Rush.....	Obstructing a fishery officer.....	Naas river.....	Fined \$25 and costs.
47	Gordon Stevens.....	Bringing salmon from above commercial boundary.....	Naas river.....	Fined \$25 and costs.
48	Oscar Johnson.....	Fishing above boundary.....	Namu bay.....	Case dismissed.
49	Andrew Sunde.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Skedans bay.....	Fined \$50 and costs, and net and 63 salmon confiscated.
50	William Leask.....	Violation Sec. 16, s.s. 16a, Fishery Regulations.....	Thurston bay.....	Fined \$500 and costs.
51	Joseph Moreau.....	Violation Sec. 16, s.s. 16a, Fishery Regulations.....	Skedans bay.....	Fined \$150 and costs.
52	Jack Loncarich.....	Fishing above boundary.....	Kwakusdis river.....	Case dismissed.
53	Dengo Tyoda.....	Cause to be brought salmon from above boundary.....	Kwakusdis river.....	Fined \$200, and costs and boat, net and 361 salmon confiscated.
54	David Hopkins.....	Fishing inside boundary.....	McKay creek.....	Case dismissed. Fined \$125 and 14 salmon confiscated.



## DISTRICT No. 3—SUPERVISOR J. F. TAIT

1	H. A. H. Rice.....	Violation Sec. 1, s. s. 4, Fishery Regulations.....	Rogers lake.....	Fined \$10 and costs.
2	Vincent Warner.....	Violation Sec. 1 Fishery Regulations.....	Cowichan river.....	Fined \$10 and costs.
3	Thomas MacDonald.....	Violation Sec. 66 Fisheries Act.....	Nanaimo river falls.....	Fined \$2 and costs.
4	John Parnall.....	Violation Sec. 5, Fishery Regulations.....	Duncan.....	Fined \$1 and costs and 2 crabs confiscated.
5	Chin Hoong.....	Violation Sec. 18, Fisheries Act.....	Duncan.....	Fined \$5 and costs and 12 crabs confiscated.
6	Chew Deb.....	Violation Sec. 18, Fisheries Act.....	Duncan.....	Fined \$5 and costs.
7	Guy Herbert.....	Violation Sec. 1, Fishery Regulations.....	Cowichan river.....	Fined \$10 and costs.
8	Owen Nixon.....	Violation Sec. 1, s. s. 4, Fishery Regulations.....	Saanich arm.....	Fined \$10 and costs.
9	Arnold Graham.....	Violation Sec. 1, s. s. 5, Fishery Regulations.....	Hornby island.....	Fined \$2 and costs.
10	Donald Reid.....	Violation Sec. 39 Fisheries Act.....	Nitinat arm.....	Suspended sentence.
11	James Stewart.....	Violation Sec. 1, s. s. 4, Fishery Regulations.....	Shawinigan lake.....	Fined \$5 and costs.
12	Wm. L. Morgan.....	Helping on a salmon purse-seine boat without a licence.	District No. 3.....	Suspended sentence.
13	Bert Berthsen.....	Operating purse-seine above limits.....	Shushartie river.....	Fined \$100 and 72 sockeye salmon confiscated.
14	Martin Fred.....	Violation Sec. 16, s. s. 16, Fishery Regulations.....	Somass river.....	Fined \$25 and costs and net and salmon confiscated.
15	Sam Campbell.....	Violation Sec. 16, s. s. 16, Fishery Regulations.....	Somass river.....	Fined \$10 and net and salmon confiscated.
16	Laurence Brighton.....	Violation Sec. 1, s. s. 4, Fishery Regulations.....	Nanaimo river falls.....	Case dismissed.
17	Jack Devaney.....	Trolling without a licence.....	Johnston strait.....	Fined \$5 and costs.
18	Russel Drummond.....	Violation Sec. 16, s. s. 16, Fishery Regulations.....	Nitinat arm.....	Fined \$20 and costs, and net and 7 salmon confiscated.
19	Jimmy Chester.....	Violation Sec. 16, s. s. 16, Fishery Regulations.....	Hobartson river.....	Fined \$10 and costs.
20	Nicols Chester.....	Violation Sec. 16, s. s. 16, Fishery Regulations.....	Hobartson river.....	Fined \$10 and costs.
21	Alfred Morley.....	Violation Sec. 1, s. s. 7, Fishery Regulations.....	Cowichan river.....	Fined \$5 and costs and 4 small trout confiscated.
22	Frank W. Tooker.....	Violation Sec. 19, s. s. 7, Fishery Regulations.....	Sutil channel.....	Fined \$5 and costs.
23	Vucko Vujovic.....	Assisting on salmon purse-seine boat without a licence.	Sutil channel.....	Fined \$5 and costs.
24	Mike Davis.....	Initials and licence number not painted on boat.....	Johnston straits.....	Fined \$1 and costs.
25	Ivan Bobac.....	Extending salmon purse-seine net from shore.....	Johnston straits.....	Fined \$10 and costs.
26	James Henderson.....	Fishing during weekly closed season.....	Cache creek.....	Fined \$100 and costs.
27	John Ferry.....	Fishing during weekly closed season.....	Cache creek.....	Fined \$100 and costs.
28	D. C. Layne.....	Violation Sec. 19, s. s. 7a, Fishery Regulations.....	Winter harbour.....	Fined \$5, and costs and salmon confiscated.
29	Jewel Hamley.....	Fishing during weekly closed season.....	Cormorant channel.....	Fined \$5 and costs.
30	Kinzaboro Chiba.....	Fishing above boundary.....	Keogh river.....	Fined \$15 and costs.
31	A. J. Vickson.....	Fishing above boundary.....	Keogh river.....	Fined 1 and costs.
32	Iver Feli and Herbert Thomas.....	Fishing for salmon in closed waters.....	Marble creek.....	Case dismissed.
33	John Hunt.....	Violation Sec. 16, s. s. 16a, Fishery Regulations.....	Quatse river.....	Fined \$25 and costs.
34	Paul Hayes.....	Violation Sec. 16, Fishery Regulations.....	Tofino inlet.....	Fined \$25 and costs.
35	Martin Warnock.....	Violation Sec. 22, s. s. 2, Fishery Regulations.....	Loughboro inlet.....	Case dismissed.
36	J. Ferry.....	Violation Sec. 16, s. s. 19, Fishery Regulations.....	Loughboro inlet.....	Case dismissed.
37	Geo. A. Brajich.....	Violation Sec. 16, s. s. 16, Fishery Regulations.....	Oyster river.....	Fined \$50 and costs.



DOMINION OF CANADA

SIXTH

ANNUAL REPORT

OF THE

DEPARTMENT OF FISHERIES

(Sixty-ninth Annual Fisheries Report  
of the Dominion)

---

FOR THE YEAR

1935-36



OTTAWA

J. O. PATENAUDE, I.S.O.

PRINTER TO THE KING'S MOST EXCELLENT MAJESTY

1936





*To His Excellency the Right Honourable the Baron Tweedsmuir of Elsfield,  
G.C.M.G., C.H., Governor General and Commander-in-Chief of the  
Dominion of Canada.*

MAY IT PLEASE YOUR EXCELLENCY:

I have the honour to submit herewith, for the information of your Excellency and the Parliament of Canada, the Sixth Annual Report of the Department of Fisheries, being the Sixty-ninth Annual Fisheries Report for the Dominion.

I have the honour to be,

Your Excellency's most obedient servant,

J. E. MICHAUD,  
*Minister of Fisheries.*

DEPARTMENT OF FISHERIES,  
OTTAWA, April 6, 1936.

## CONTENTS

	PAGE
<b>DEPUTY MINISTER'S REPORT COVERING—</b>	
Review of Fisheries for Calendar Year 1935.....	6
Fisheries Foreign Trade.....	14
Stimulating Fish Consumption.....	16
Inspection of Fisheries Products.....	17
Instructional Services.....	18
Expansion of Oyster Farming.....	18
Fish Cultural Work.....	20
Fisheries Research.....	20
Conditions in the Lobster Fishery.....	21
Atlantic Salmon Stocks.....	22
Fisheries Intelligence.....	23
Sealing Revenue.....	24
Fishing Bounty Payments.....	25
International Fisheries Commission.....	26
North American Council on Fishery Investigations.....	29

## APPENDICES

1. Reports of Chief Supervisors of Fisheries.....	31
2. Summary of the Work of the Biological Board of Canada.....	88
3. Report of the Fish Culture Branch of the Department.....	92
4. Report on Inspection of Fish and on Technical Instruction to Fishermen.....	170
5. Report of the Fisheries Engineer.....	175
6. Report on Oyster Cultural Work by the Department in 1935.....	186
7. A Statement of Fisheries Expenditure and Revenue for the Fiscal Year 1935-36 and a Summary of Expenditure and Revenue, by Provinces, for the Period 1867 to 1935-36.....	192
8. A Summary Showing the Number of Licences Issued in 1935.....	198
9. A Summary of Lobster Fishing Licences Issued Each Year since 1928.....	201
10. A Return Showing the Prosecutions for Offences under the Fisheries Act.....	203

## GRAPHS

Lobster Catch and Pack of Canned Lobsters in the Maritime Provinces and the Magdalen Islands, 1922-1935.....	51
Commercial Catch of Salmon for Nova Scotia, 1870 to 1934, and for the Counties Border- ing on the Gulf of St. Lawrence Area, 1912-13 to 1934.....	53
British Columbia Pack of Canned Salmon, 1910-1935.....	81



## DEPUTY MINISTER'S REPORT

To the Hon. J. E. MICHAUD,  
Minister of Fisheries.

SIR,—I have the honour to submit the Sixth Annual Report of the Department of Fisheries, which is the Sixty-ninth Annual Report on the fisheries of Canada, and is for the fiscal year ended March 31, 1936. The following subjects among others are referred to in the report:—

Results of Fisheries Operations in the Calendar Year, 1935.

Foreign Trade in Fisheries Products.

Expansion of Oyster Farming.

Fisheries Instructional Services.

Fisheries Research.

Fish Culture.

Stimulating Fish Consumption.

Conditions in the Lobster Fishery.

Atlantic Salmon Stocks.

Fisheries Intelligence.

Fish Inspection Work.

Pelagic Sealing Revenue.

Fishing Bounty Payments.

Activities of the North American Council on Fishery Investigations.

The Work of the International Fisheries Commission or Pacific Halibut Commission.

The appendices include:—

Reports of the Chief Supervisors of Fisheries.

Summary of the Work of the Biological Board of Canada.

Report of the Fish Culture Branch of the Department.

Report on Inspection of Fish and on Technical Instruction to Fishermen.

Report of the Fisheries Engineer.

Report on Oyster Cultural Work by the Department in 1935.

A Statement of Fisheries Expenditure and Revenue for the Fiscal Year 1935-36 and a Summary of Expenditure and Revenue, by Provinces, for the Period 1867 to 1935-36.

A Summary Showing the Number of Licences Issued in 1935.

A Summary of Lobster Fishing Licences Issued Each Year since 1928.

A Return Showing the Prosecutions for Offences under the Fisheries Act.

Included in the report are statistical graphs dealing respectively with canned salmon production, British Columbia, since 1910, the catch of lobsters and pack of canned lobsters in the Maritime Provinces and the Magdalen Islands since 1922, and fluctuations in the catch of salmon in certain Atlantic areas.

## REVIEW OF THE FISHERIES FOR THE CALENDAR YEAR, 1935

There were 953,201,600 pounds of fish landed in the whole of Canada during the year 1935. This amount includes salt water fish and fish from all of the inland waters where commercial fishing operations are carried on. In the preceding year the catch of all kinds amounted to 933,086,900 pounds. Increased catches were reported in the provinces of New Brunswick, Ontario, Saskatchewan, Alberta, British Columbia and the Yukon Territory. In the remaining provinces there were small decreases.

The marketed value for all of the provinces came to \$34,427,854 compared with \$34,022,323, or an increase of \$405,531.

Table I, below, shows the marketed value of the 1935 production by provinces, and gives also the figures for each of the four preceding years. In table II, the marketed value figures for the sea and inland fisheries, respectively, for 1935 are shown.

TABLE I

	1935	1934	1933	1932	1931
	\$	\$	\$	\$	\$
Nova Scotia.....	7,852,899	7,673,865	6,010,601	6,557,943	7,986,711
New Brunswick.....	3,949,615	3,679,970	3,000,045	2,972,682	4,169,811
Prince Edward Island.....	899,685	963,926	842,345	988,919	1,078,901
Quebec.....	1,947,259	2,306,517	2,128,471	1,815,544	1,952,894
Ontario.....	2,852,007	2,218,550	2,089,842	2,147,990	2,477,131
Manitoba.....	1,258,335	1,465,358	1,076,136	1,204,892	1,241,575
Saskatchewan.....	252,059	219,772	186,417	186,174	317,963
Alberta.....	225,741	245,405	144,518	153,789	153,897
British Columbia.....	15,169,529	15,234,335	12,001,471	9,909,116	11,108,873
Yukon Territory.....	20,725	14,625	17,100	20,060	29,550
Total.....	34,427,854	34,022,323	27,496,946	25,957,109	30,517,306

TABLE II

	Sea	Inland	Total
	\$	\$	\$
Nova Scotia.....	7,852,899	.....	7,852,899
New Brunswick.....	3,924,893	24,722	3,949,615
Prince Edward Island.....	899,685	.....	899,685
Quebec.....	1,328,394	618,865	1,947,259
Ontario.....	.....	2,852,007	2,852,007
Manitoba.....	.....	1,258,335	1,258,335
Saskatchewan.....	.....	252,059	252,059
Alberta.....	.....	225,741	225,741
British Columbia.....	15,169,529	.....	15,169,529
Yukon Territory.....	.....	20,725	20,725
Total.....	29,175,400	5,252,454	34,427,854

*Capital Investment and Personnel.*—The total capital invested in the fishing industry was \$43,617,888, of which \$26,473,082 represents the value of the equipment used in the primary branch of the industry, that is the value of the vessels, boats, nets and other gear and wharves. In the secondary operations, the canning and curing, the capital investment was \$17,144,806. The secondary operations are practically all carried out in sea fishing districts, while in the primary operations the investment was divided as follows: sea fishing \$22,000,054 and inland fishing \$4,473,028. The total capital investment in the industry was greater in 1935 than in 1934 by \$32,386.

The number of persons engaged in the industry was 82,918 of whom 68,557 were employed in catching the fish and bringing them to shore and 14,361 in canning and curing operations. Of those engaged in primary operations 56,833 were in sea fishing areas and 11,724 in the inland districts. The total number engaged in the industry dropped over 500 below the figure for the previous year.

*Major Fisheries.*—The largest and most important branch of the fishing industry from a marketed value standpoint is the salmon fishery, with the lobster and cod fisheries coming second and third respectively. In the inland waters whitefish is the most important variety taken. During the year under review the total catch of salmon was 182,420,500 pounds having a marketed value of \$12,540,307. The greater part of the catch was taken on the Pacific coast. Lobsters and cod are taken almost altogether on the Atlantic coast, only a small quantity of cod and no lobsters being caught on the Pacific coast. The year's catch of lobsters was 31,996,900 pounds with a marketed value of 4,378,742, while the total catch of cod was 153,915,000 pounds having a marketed value of \$2,758,140. The total catch of whitefish was 14,745,600 pounds, which had a marketed value of \$1,432,072.

#### NOVA SCOTIA

The year's catch of fish and shellfish by Nova Scotia's fishermen amounted to 235,357,700 pounds as compared with 238,003,300 pounds in the preceding year. On the other hand, the marketed value total showed an increase of about \$180,000, reaching \$7,852,899 as compared with \$7,673,865 in 1934. From the marketed value standpoint, the lobster fishery ranks first in Nova Scotia, and the 1935 catch, 17,683,600 pounds, was worth on the market \$2,732,872. Some years ago the cod fishery showed greater value return than the lobster fishery, but in 1930 the positions of the two fisheries were reversed, and since that time the lobster value has been the greater. Last year's catch of cod by Nova Scotia fishermen, 92,439,100 pounds, with a marketed value of \$1,809,273, decreased by 8,228,200 pounds, and on the value side there was a drop of \$259,000. The haddock fishery is third in importance among Nova Scotia fisheries and produced during the year a catch of 35,634,200 pounds, which had a marketed value of \$1,104,133. On each side of the reckoning the figures were larger than in the preceding year. Herring and halibut were taken in increased quantities, but on the other hand, the catch of mackerel fell off. Swordfish which, in Canadian waters, are taken off the coast of Nova Scotia only, were landed last year in larger quantity than ever before, the total catch reaching approximately 2,234,000 pounds. Swordfish marketed value, \$264,100 in round figures, went ahead of the figures for 1934 by over \$87,000. The catch of salmon was 603,000 pounds, or only slightly less than in the year before. There were 5,375 barrels of oysters landed, which meant an increase of 2,141 barrels. There was also a large increase in the scallop catch, which totalled 126,371 gallons, shelled, or a gain of 53,235 gallons. Fish meal production for the year, 4,525 tons, was slightly smaller than in the previous year.

#### NEW BRUNSWICK

The total catch of fish and shellfish from the sea and inland fisheries of New Brunswick was 139,028,000 pounds, having a marketed value of \$3,949,615. In the preceding year the landings were 135,738,900 pounds, and the marketed value was \$3,562,082. Increased catches of cod, herring, smelts and clams were shown in the sea fisheries and more shad in the inland waters. There was a comparatively small decrease in the catch of sardines but the marketed value increased by some \$297,000. The catch of cod, 14,984,800 pounds, shows an increase, but there was a drop in the marketed value. Salmon landings were



1,656,200 pounds (sea, 1,607,600; inland, 48,600) as compared with 1,858,400 pounds in 1934. The total catch of freshwater fish amounted to 491,100 pounds, with shad by far the most important species landed, both as regards quantity and marketed value. The shad catch was 323,800 pounds, an increase of 49,600 pounds over the 1934 figures.

#### PRINCE EDWARD ISLAND

During the year 20,891,800 pounds of fish and shellfish with a marketed value of \$899,685 were landed by Prince Edward Island fishermen. In round numbers the year's figures represent a decrease of 2,434,000 pounds in quantity and a decrease of \$64,000 in marketed value. The catch from the lobster fishery, the most important of the island's fisheries, was 6,387,000 pounds, with a marketed value of \$605,100. In the preceding year 7,658,000 pounds of lobsters were caught and their value as marketed was \$674,100. Following lobsters, cod, oysters, herring and smelts come next in order of importance in Prince Edward Island. In 1935 smelts were the only one of these species to be taken in increased quantity and to have increased marketed value. The value return from the cod and oyster fisheries was slightly greater than in 1934, although landings showed a little decrease. In the case of herring there was a decrease both on the catch side and the value side.

#### QUEBEC

Production from Quebec's fisheries, sea and inland fisheries together, had a marketed value of \$1,947,259 in the past year as compared with \$2,306,517 in 1934. Sea fish and shellfish were worth altogether \$1,328,394, as marketed, a decrease of \$388,754 from the figures of the previous year. The freshwater catch had a marketed value of \$618,865 and here there was an increase of nearly \$29,500 over the 1934 return. The combined landings from all the fisheries decreased by slightly more than 16,940,000 pounds and totalled 89,621,900 pounds. Cod is the chief variety of fish taken by the sea fishermen and last year both catch and marketed value fell off sharply. The catch, 40,276,900 pounds, showed a drop of 11,586,900 pounds and a decrease of \$299,877 brought the marketed value down to \$609,423. There were also decreases both in catch and value in the case of lobsters, second in importance to cod in Quebec. The quantity of lobsters landed was 2,442,600 pounds as compared with 3,574,700 pounds in the year before and the marketed value, \$222,064, showed a decrease of \$73,836. Sea herring landings amounted to 28,640,500 pounds and they had a marketed value of \$211,459—a decrease on each side of the record. It may be noted that combined marketed value of the year's production of cod, lobsters and herring made up 78 per cent of the Quebec sea fisheries total. Various other sea fisheries in addition to those named are, of course, carried on by Quebec fishermen and among the fish to be taken in increased quantity during the past year were mackerel, salmon and smelts, the mackerel landings increasing from slightly more than 2,883,000 pounds to 3,564,000 pounds. In the inland division, eels, perch, pickerel and salmon were each taken in somewhat smaller quantities than in the preceding year, although in the case of eels and pickerel the market value increased, but all other kinds of fish taken commercially in Quebec's freshwater fisheries were caught in increased quantities.

#### ONTARIO

Ontario's catch of all kinds of fish was 35,213,100 pounds, with a marketed value of \$2,852,007. This is an increase in both catch and value, the former rising by 3,982,500 pounds and the latter by \$633,457. There were increased catches of blue pickerel, catfish, eels, perch, pickerel, pike, sturgeon, trout and

whitefish. Four species, trout, whitefish, perch and blue pickerel, had a combined value of more than \$2,000,000. The trout landings, 6,256,300 pounds, show an increase of almost a million pounds in quantity and the marketed value of \$738,243 is greater by almost \$183,000 than in the year before. The catch of whitefish (second in importance from a monetary point of view), was 5,478,300 pounds, and its marketed value was \$684,789. These figures represent an increase of 555,000 pounds and \$89,000. While the catch of sturgeon increased more than 20,000 pounds to 110,500 pounds, the production of caviar, 2,694 pounds, is not much greater than in the previous year. The herring catch, 2,529,100 pounds, was one of the few to show a drop, and this decrease amounted to 350,000 pounds.

#### MANITOBA

In Manitoba the production of all kinds of fish for the year was 19,696,000 pounds, with a marketed value of \$1,258,335. The chief species taken were pickerel, whitefish, saugers, tullibee and goldeyes, in order of importance. The catch of pickerel, 7,218,300 pounds, with a marketed value of \$498,958, was less by 1,126,500 pounds than in 1934 and on the value side there was a drop of \$54,500. Whitefish, tullibee, perch and saugers also show decreased landings, but the catch of pike was greater than in the earlier year. The catch of whitefish was 3,787,800 pounds with a marketed value of \$376,221. The drop in catch in this case was slightly more than 1,109,000 pounds and in marketed value \$46,600.

#### SASKATCHEWAN

The year's catch in Saskatchewan totalled 4,953,100 pounds and it had a marketed value of \$252,059. There was an increase of almost 915,000 pounds on the one side and \$32,200 on the other. The catch of whitefish, the most important variety, was 3,320,200 pounds, with a marketed value of \$187,949, which meant an increase in catch of 789,700 pounds, and \$25,600 in value. Of the other chief varieties taken, pickerel, tullibee and pike show increases in both the catch and marketed value. Production from the trout fishery decreased both in quantity and value.

#### ALBERTA

During 1935 Alberta's commercial fishermen made a total catch of 4,156,700 pounds. The marketed value was \$225,741. These figures represent a slight increase in the catch but a drop on the value side. The chief kinds taken were whitefish, pickerel, pike and tullibee. The catch of whitefish, 1,750,800 pounds, decreased slightly and so did whitefish marketed value, \$146,113. The catch of pike, 976,200 pounds, was greater than in 1934, as was the catch of tullibee, 466,700 pounds. On the other hand, pickerel catch, 531,600 pounds, decreased by 414,900 pounds.

#### BRITISH COLUMBIA

On page 13 will be found a summary of fishing operations in British Columbia under the heading "Pacific Coast Fisheries."

#### YUKON TERRITORY

The fisheries of the Yukon are not very extensive and the total catch in 1935 was 104,500 pounds, with a marketed value of \$20,725. The catch of salmon accounted for half of the total catch and marketed value.



## DEPARTMENT OF FISHERIES

## ATLANTIC COAST SEA FISHERIES RESULTS

During the year 1935 the quantity of Atlantic fish and shellfish landed was 19,307,300 pounds less than in the previous year. The following table shows the landings by provinces:—

	1935	1934
	lb.	lb.
Nova Scotia.....	235,357,700	238,003,300
New Brunswick.....	138,536,900	135,258,700
Prince Edward Island.....	20,891,800	23,326,200
Quebec.....	80,682,900	98,188,400
Total landings.....	475,469,300	494,776,600

*Cod, Haddock, Hake and Cusk, and Pollock.*—The total quantity of these fish landed was 216,268,900 pounds, as compared with 238,853,200 pounds in 1934, while the marketed value was \$4,135,460, as compared with \$4,712,375. By species, the landings were: Cod, 152,245,900 pounds; haddock, 36,842,600 pounds; hake and cusk, 18,975,600 pounds; and pollock, 8,204,800 pounds. New Brunswick was the only province to show an increase in the catch of cod, Nova Scotia the only one to show an increase in haddock landings. Prince Edward Island and Quebec showed increases in the catch of hake and cusk and the New Brunswick catch of pollock was greater than in the year before. The catch of haddock for Nova Scotia, the largest producer, was 35,634,200 pounds, an increase of almost 1,500,000 pounds. Total haddock marketed value, 1,129,695, was slightly greater than in 1934. Dried fish production fell off considerably, due to inability of the producers to market fish in this form in as large quantities as formerly. The production of dried, not including boneless fish, amounted to 28,956,500 pounds, compared with 35,220,200 pounds in the preceding year.

*Herring, Mackerel and Sardines.*—While the total quantity of these species taken was somewhat less than in 1934 the value was a little greater, due to increased prices for herring and sardines. Total herring catch, 101,727,700 pounds, was less than in the year before but the marketed value, \$1,116,109, was \$78,000 greater. The mackerel catch was 16,049,500 pounds, with a marketed value of \$308,721, a decrease in both instances. In the case of sardines there were 37,533,200 pounds landed, having a marketed value of \$1,335,798; the catch was slightly less than in 1934 but the value was almost \$300,000 greater. Sardines were taken in New Brunswick and Quebec. The catch of herring in both New Brunswick and Nova Scotia was greater than in the previous year while the catch of mackerel in Quebec showed an increase.

*Flounders, Halibut and Swordfish.*—Increased catches and marketed values were shown for swordfish and halibut while the catch of flounders increased but the marketed value fell off. Nova Scotia alone produces swordfish and the catch of 2,233,900 pounds was a record one and greater than the year before by 824,800 pounds, while the marketed value of \$264,097 increased by \$87,457. The flounder catch for the coast was 864,400 pounds with a marketed value of \$26,624. In Prince Edward Island the catch of flounders jumped from 15,500 pounds in 1934 to 130,300 pounds and New Brunswick's 1935 catch of 199,900 pounds increased slightly. Nova Scotia had a catch of 529,700 pounds, which was a little less than in 1934, while in Quebec 4,500 pounds were landed. The total catch of halibut was 3,020,300 pounds with a marketed value of \$344,725. Nova Scotia landed 2,903,500 pounds of the total and Quebec, 108,300 pounds, the remainder being caught by New Brunswick fishermen.



*River Spawning Fish.*—Quebec was the only one of the four provinces to show an increased catch of salmon. The total salmon catch for the coast was 3,270,500 pounds with a marketed value of \$406,246, a decrease in both cases. Quebec's catch was 1,053,600 pounds, New Brunswick's 1,607,600 pounds, and Nova Scotia fishermen landed 603,000 pounds. Smelt catch totalled 7,729,900 pounds and had a marketed value of \$570,745, an increase on both sides. New Brunswick is the chief smelt producing province and its catch of 5,273,900 pounds in 1935 shows an increase of more than 1,500,000 pounds over 1934 figures. Prince Edward Island came second in production with 1,001,500 pounds; Quebec had 835,900 pounds to its credit and Nova Scotia 618,600 pounds. Only in Nova Scotia was there a decrease. There were 8,225,600 pounds of alewives taken in the three Maritime Provinces, none being taken in Quebec. The marketed value was \$97,214. New Brunswick showed a catch of 4,813,900 pounds and Nova Scotia 3,314,300 pounds, while Prince Edward Island had a catch of 97,400 pounds.

*Lobsters.*—The catch of lobsters for the coast showed a substantial drop, with 31,996,900 pounds being taken as compared with 36,199,200 pounds in 1934. Landings fell off in each of the four provinces. Notwithstanding decrease in catch total, the marketed value shows an increase of \$108,978. The value gain was the result of better prices for the lobsters shipped in shell to market. Each of the four provinces recorded a decreased catch.

Statistics showing the catch of lobsters, the quantity canned, shipped in shell, meat and tomally for the different provinces for the years 1935, 1934, and 1933, will be found in the following tables:—

## CATCH

	1935		1934		1933		1932	
	Cwts.	Marketed Value	Cwts.	Marketed Value	Cwts.	Marketed Value	Cwts.	Marketed Value
		\$		\$		\$		\$
Nova Scotia.....	176,836	2,732,872	184,590	2,487,633	176,858	1,884,715	237,730	2,711,371
New Brunswick...	54,831	818,699	65,073	812,045	74,940	830,363	98,722	1,041,845
Prince Edward Island.....	63,876	605,107	76,582	674,186	91,547	591,801	114,570	750,039
Quebec.....	24,426	222,064	35,747	295,900	31,571	217,476	32,466	242,056
Totals.....	319,969	4,378,742	361,992	4,269,764	374,916	3,524,355	483,488	4,745,311

## SHIPPED IN SHELL

Nova Scotia.....	90,840	1,652,082	91,418	1,365,094	84,271	1,087,770	99,527	1,418,178
New Brunswick...	20,537	381,092	22,135	311,446	27,286	348,473	37,777	471,288
Prince Edward Island.....	2,991	32,430	3,546	38,704	9,568	71,258	3,549	29,277
Quebec.....	783	8,200	5,827	54,273	2,800	25,525	3,630	29,400
Totals.....	115,151	2,073,804	122,926	1,769,517	123,925	1,533,026	144,483	1,948,143

## QUANTITY CANNED

Nova Scotia.....	Cases 46,863	1,021,258	Cases 50,553	1,036,487	Cases 50,729	754,590	Cases 74,060	1,245,654
New Brunswick...	18,275	404,260	23,815	477,939	26,417	454,424	35,490	537,991
Prince Edward Island.....	25,170	556,596	30,214	624,771	32,895	512,138	44,490	711,119
Quebec.....	9,597	213,519	11,562	241,417	12,021	191,781	12,759	212,656
Totals.....	99,905	2,195,633	116,144	2,380,674	122,062	1,912,933	166,799	2,707,420

## DEPARTMENT OF FISHERIES

## TOMALLEY

	Cases	\$	Cases	\$	Cases	\$	Cases	\$
Nova Scotia.....	3,528	33,560	3,418	30,951	2,432	18,988	2,624	19,415
New Brunswick...	617	4,497	479	3,200	236	1,825	190	1,486
Prince Edward Island.....	1,358	15,661	1,149	9,386	1,032	6,905	939	8,323
Quebec.....	36	345	35	210	25	170	.....	.....
Totals.....	5,539	54,063	5,081	43,747	3,725	27,888	3,753	29,224

## LOBSTER MEAT

	Cwts.		Cwts.		Cwts.		Cwts.	
Nova Scotia.....	510	25,972	1,077	55,101	602	23,367	506	28,124
New Brunswick...	577	28,850	388	19,400	553	25,641	751	31,080
Prince Edward Island.....	6	420	29	1,325	26	1,500	22	1,320
Quebec.....	.....	.....	.....	.....	.....	.....	.....	.....
Totals.....	1,093	55,242	1,494	75,826	1,181	50,508	1,279	60,524

*Other Shellfish.*—While clams, quahaugs, oysters, and scallops are taken in fairly large quantities, winkles, mussels, and crabs are landed in small amounts. There were 51,070 barrels of clams with a marketed value of \$111,740 and \$1,785 barrels of quahaugs, with a value of \$7,041, taken during 1935, compared with a combined total of 33,676 barrels of both kinds taken in the preceding year with a marketed value of \$78,483. In this year's statistical report clams and quahaugs are being shown separately. The quantity of oysters landed was 23,760 barrels with a marketed value of \$136,517, an increase on both sides. Both Nova Scotia and New Brunswick showed larger landings, while a small decrease occurred in Prince Edward Island. The catch of scallops in Nova Scotia was almost double that of the year before, 126,371 gallons being landed in 1935. The New Brunswick landings of 6,734 gallons were less than half as large as in the previous year, while the quantity in Quebec increased. The total landings were 133,225 gallons with a marketed value of \$207,641. Scallops were not taken by Prince Edward Island fishermen in 1935.

## INLAND FISHERIES

There were 73,553,500 pounds of fish taken in the inland waters of Canada, including inland New Brunswick and Quebec, having a marketed value of \$5,252,454. In the previous year the catch was 71,674,900 pounds and the value \$4,780,585. The following table shows the landings of the chief varieties for the past five years:—

	1935	1934	1933	1932	1931
	lb.	lb.	lb.	lb.	lb.
Whitefish.....	14,745,600	14,461,500	15,212,500	13,847,800	15,785,600
Pickeral (or dore).....	10,954,800	12,251,200	10,627,200	8,949,800	9,182,100
Tullibee.....	3,972,100	4,407,600	4,230,000	4,764,400	4,279,500
Trout.....	6,624,200	5,884,800	5,073,400	5,007,200	7,155,700
Pike.....	4,476,100	3,719,500	4,114,600	4,140,000	5,928,600
Herring.....	3,453,600	3,799,200	3,418,000	3,669,200	5,950,800
Perch.....	7,115,300	7,213,900	4,036,700	6,021,300	5,037,600
Eels.....	2,306,300	2,297,000	2,495,000	1,930,700	1,786,700
Blue pickeral.....	5,123,000	2,432,100	4,216,400	4,061,000	5,404,800
Mullets.....	329,700	213,900	236,200	400,000	358,100
Carp.....	2,102,600	2,132,800	1,854,500	1,806,100	1,600,200
Goldeyes.....	334,100	330,600	287,600	309,700	350,900

The catch of whitefish was slightly greater than in 1934. Ontario shows the year's largest catch of this species with Manitoba and Saskatchewan next in order. The Ontario and Saskatchewan landings increased but a decrease was shown for Manitoba. Blue pickerel catch in Ontario shows a remarkable increase, the landings of 5,123,000 pounds being more than double that of the preceding year. Next to whitefish, pickerel were taken in largest quantity among the freshwater varieties of fish but, nevertheless, there was a decrease of almost 1,300,000 pounds. Manitoba is the big pickerel-producing province, having 7,218,300 pounds to its credit in 1935 out of an aggregate Canadian production of 10,954,800 pounds.

Trout are taken mostly in Ontario, so far as commercial fishing is concerned. During the past year Ontario accounted for 6,256,300 pounds out of a total trout catch of 6,624,200 pounds.

The eel catch is landed chiefly in the inland waters of Quebec, where in 1935 the fishermen caught 2,226,400 pounds. Up to a short time ago there was a good market for eels in Germany but it has offered much less favourable opportunity in the past two years than formerly, with the result that shippers have had to rely more on the markets of eastern section of the United States, mainly New York.

#### PACIFIC COAST FISHERIES

While there was an increase in the total catch of all kinds of fish in British Columbia, the marketed value showed a slight decline of \$64,806. The catch of all kinds was 404,178,800 pounds as compared with 366,615,400 pounds and the marketed value \$15,169,529 compared with \$15,234,335 in the preceding year. Increased catches were noted in each of the "big four" of the coast, salmon, halibut, herring and pilchards.

*Salmon.*—There were 178,943,100 pounds landed or an increase of 12,953,100 pounds, while the marketed value of \$12,099,275 shows a drop of \$302,767. The pack of 1,529,022 cases with a marketed value of \$9,653,897 meant a small decrease in each instance. The pack consisted chiefly of chums, pinks and sock-eyes, in order of production. There was a decrease of over 100,000 cases of chums and 25,000 cases of sockeyes but an increase of almost 80,000 cases of pinks in the pack for the year. While the pack of salmon makes up 84 per cent of the marketed value in the case of salmon, there were also fairly large quantities marketed fresh, 28,834,700 pounds, drysalted 14,664,100 pounds and mild cured 2,036,800 pounds. In the marketed fresh the increase was more than 11,800,000 pounds, and an increase of more than 5,000,000 pounds in the dry-salted, while the mild cured showed a decrease. The quantity of salmon roe produced was 1,023,000 pounds, an increase of 400,000 pounds.

*Halibut.*—The catch of 10,192,700 pounds by Canadian fishermen was an increase of a little more than 420,000 pounds over the 1934 figures while, in addition to this, some 6,900,000 pounds were landed by United States vessels, chiefly at Prince Rupert, for transshipment to the United States. The value of livers sold from the Canadian vessels was \$80,513 compared with \$36,439 in 1934.

*Herring.*—The greater part of the catch of these fish was used in dry-salting for the Orient. Due to unsettled conditions in that part of the world during the past year there was not such a demand for these fish so that production dropped to 30,271,000 pounds, a decrease of more than 11,000,000 pounds. In addition to drysalting, British Columbia herring are used fresh, canned, kippered, pickled, used as bait and used in the production of meal and oil. The total catch of 100,850,700 pounds showed an increase of 18,800,000 pounds, while the marketed value of \$580,031 showed a drop of almost \$49,000 from the marketed value of 1934.



*Pilchards.*—The pilchard catch, used chiefly in the production of meal and oil, shows an increase of more than 5,000,000 pounds. The landings amounted to 91,141,100 pounds and the marketed value was \$670,338, an increase in the latter instance of slightly more than \$120,000. Production of meal and oil was greater than in 1934, the quantity of meal manufactured being 8,681 tons, while 1,649,392 gallons of oil were extracted, an increase of more than 14,000 gallons. Pilchards are also canned and small quantities used fresh and as bait.

*Other Fisheries.*—The catch of gray cod, 1,669,100 pounds, was greater by 388,000 pounds and the landings of ling cod, 6,284,100 pounds, show an increase of slightly more than 1,500,000 pounds. Both crabs and oysters were landed in larger quantities than in the preceding year, the catch of crabs being 670,800 pounds, while 3,353 barrels of oysters were landed. The number of whales taken was 202, with a marketed value of \$105,360 for the oil, meal and fertilizer produced. In the preceding year the marketed value of the products from 350 whales was \$183,738. Under the Pelagic Sealing Treaty the capture of fur seals off the British Columbia coast may be carried on by Indians only, and the number of seals so taken in 1935 was 841, as compared with 256 in the year before.

### INCREASE IN FISHERIES TRADE

Canada's foreign trade in products of the fisheries again showed a substantial increase in value in 1935. Using round figures here, as in all trade references in these paragraphs, the calendar year's business, export and import, totalled \$27,344,000, or \$2,833,000 more than in 1934. Exports were valued at \$24,839,000, which meant that there was an increase of \$2,352,000 on that side of the account. Import trade, \$2,505,000, was greater by \$481,000 than in the preceding year.

Trade in canned and fresh and frozen products accounted for practically all of the net increase in export value, although there was a small gain to be credited to the business in fish and whale oils. Mainly because of bigger sales of canned salmon, the trade in canned fish and shellfish exceeded that of 1934 by \$1,345,000, with the total standing at \$10,475,000. Exports in the "fresh and frozen" classification, amounting in value to \$9,150,000, showed an increase of nearly \$1,230,000. Over against these gains, however, there were decreases in the case of two other export groups—one the dried, smoked and pickled fish and the other a group of miscellaneous products including fish meal. The trade in commodities of the former group, \$4,342,000 was less by \$80,000 than in the year before while in the second group there was a relatively sharp decrease of \$158,000, with the year's sales totalling only \$520,000.

Close to a million dollars of the year's import business—or, putting it more nearly exactly, \$979,000—was done with the United States, which increased its sales to Canada by \$342,000, but canned sardines, mainly from Norway, made up the largest single item on the import side of the record. Sardine importations were valued at \$360,000, with the purchases from Norway amounting to \$291,000. Oysters, nearly all of them from the United States, came next in value, approximately \$206,000; among them were shelled oysters in bulk from the United States to the value of \$178,000. Other imports reaching substantial figures, so far as dollars and cents are concerned, included whale oil worth \$443,000, most of it bought from United States sources; cod liver oil to the value of nearly \$230,000 from Norway, Newfoundland, the United States, and the United Kingdom; canned crabs, shrimps, and clams, valued at \$145,000, from the United States and Japan; pickled herring, \$116,000, from the United Kingdom (\$43,000), the United States, the Netherlands, and Newfoundland; and Japanese canned tuna valued at \$100,000. Whale oil, pickled herring, and cod

liver oil were the major commodities entering into import trade with Great Britain, which increased the aggregate value of its shipments to Canada by some \$67,000 and brought it to a total of \$200,000.

Of the year's export gain of \$2,352,000, approximately 91 per cent was accounted for by improvement in the trade with the United States and the United Kingdom, which, reckoning on the value basis, together absorb more than two-thirds of the shipments which Canada's fishing industry sends abroad. The year's sales to the United States had a value of \$10,314,000 and to Great Britain \$6,746,000. However, although the greater business was done with the former country the larger increase was in the trade with Britain—\$1,208,000 as compared with \$1,034,000.

It is, of course, to be expected, keeping proximity in mind, that the Dominion's fisheries sales to the United States should consist largely of fresh and frozen fish and in 1935 nearly four-fifths of the exports to that market, expressed in terms of value, were made up of fish in these forms. As already stated, the export business with the United States amounted in all to \$10,314,000 and of this amount the shipments of fresh and frozen fish accounted for \$8,096,000. Live lobsters from the Atlantic provinces and whitefish from the freshwater areas of the interior were the principal species entering into this trade but the sales also included large quantities of some other fish such as smelts, salmon, trout, swordfish, herring, haddock, and cod.

On the other hand; most of the exports to the United Kingdom continued to be made up of canned products such as salmon and lobsters. The trade with the British market in canned salmon increased by almost \$900,000, reaching a total of \$4,159,000. There was a much smaller increase in the value of canned lobster shipments to the same market but the gain, nevertheless, was substantial, \$101,000, and brought the business up to \$1,307,000. While it is true that our export trade with Britain is mainly in canned products, there has been in recent years, as noted in previous departmental reports, a gratifying growth in purchases of Canadian fresh and frozen salmon and halibut by United Kingdom buyers, and there was a further increase in 1935. Halibut sales to the Old Country increased from 15,800 hundredweights, roundly stated, in 1934 to 25,600 hundredweights in 1935 and in value from \$149,000 to more than \$234,000. In the case of salmon the year's shipments were nearly 49,450 hundredweights, a gain of about 10,500 hundredweights, and they had a value of \$653,000, a gain of \$70,000.

Exports of canned salmon during the year exceeded in value the foreign business done in any other one Canadian fisheries product, although the canned salmon sales amounted to \$7,395,000 or nearly \$1,490,000 more than in the preceding year. The British market continued to be the largest single outlet for canned salmon from the Dominion, making purchases to the value of \$4,159,000 as already pointed out. Shipments to Australia also showed a relatively large increase, \$599,000, and amounted in value to \$1,876,000. Business with several other countries, for example New Zealand and France, was not as large, however, as in the earlier year.

In the canned fish group, lobsters and sardines rank next after salmon in Canadian export trade. There was betterment in the canned sardine business during the year, both as regards quantity exported and total money return, though the betterment did not reach large figures, but the situation was otherwise in the case of canned lobsters. More than 54,100 hundredweights of sardines, valued at over \$448,000, were shipped abroad; the value gain was \$65,000. Lobster exports, between forty-five and forty-six thousand hundredweights, were less by almost 7,250 hundredweights than in the year before and their total value \$2,275,000 decreased by \$225,000. Sales to the United Kingdom, the



largest buyer of Canadian canned lobster, exceeded those of 1934 by \$101,000, as stated in an earlier paragraph, but this gain was more than offset by decreases in business elsewhere.

Conditions in the markets for dried fish, which has long been among the important products of the Canadian fishing industry, continued unsatisfactory during 1935, with consequent adverse effect upon fishermen and exporters of the Atlantic coast, which is the Dominion area where dried fish is produced. Several factors contributed to the unsatisfactory condition, factors such as continued unsettlement of world markets, restrictive measures imposed by certain countries, severe competition from other producing nations, and complications arising out of the European situation. Dried cod is the most important of our dried fish products and exports of cod during 1935 decreased by \$418,000, amounting only to \$1,538,000.

### STIMULATING FISH CONSUMPTION

Steps were taken during the year looking to the continuance of the program of fish cookery demonstrations and addresses which was begun by the department several years ago but had been interrupted at the end of 1934 by the death of the woman employee who had been carrying it on. The work had justified itself, both to the fishing industry and the department, and its continuance and extension was desirable. Authority was therefore obtained for the appointment of two demonstrator-lecturers, one of them to be bilingual. The selection of the appointees was, of course, a matter for the Civil Service Commission. Positions of this kind, however, are not easy to fill quickly if they are to be filled satisfactorily. Those chosen for them must be women who not only are skilled in fish cookery and have a sound knowledge of the nutritive and health value of fish foods but they must also be equipped with a combination of other qualifications, including experience in planning and conducting public demonstrations of cooking methods, ability in public speaking and in the preparation of written material, sound judgment, and tact. Special care was therefore necessary in making selections but the commission was able to choose two suitable persons from among the applicants, who, it may be noted, had included women from all of the sea fisheries provinces and from most of the other provinces as well. Unfortunately, it developed later that one of the appointees found herself unable to report for duty. The other, a bilinguist, began work in the latter part of the fiscal year, going first to Quebec, where, it is believed, intelligent effort can bring about a substantial increase in fish consumption. Support for this belief had been given by the results of earlier work done in the province before the instructional program had temporarily to be discontinued over a year ago. Since the resumption of the program public demonstrations have been held in several Quebec centres, demonstrations and addresses have been given at different institutions where many persons are in residence throughout most of each year and large quantities of food must be served, and at the request of Women's Institutes addresses and demonstrations have been given at a number of their county conventions. Work in Quebec during the early part of the coming fiscal year will include instructional course at several regional summer schools attended by domestic science teachers.

While it is felt that the department's endeavour to widen popular knowledge of the merits of Canadian fish foods and the best methods of preparing them for the table will continue to be an effective agency toward expanding the demand for our fish and shellfish the point should be emphasized that maximum results will be obtainable only if the producers and fish dealers are alert to capitalize upon the increased interest aroused by the demonstrator-lecturers. The department's share, which perhaps should also include some special advertising effort



if financial conditions will permit of the large expenditure which a campaign of that kind would require, is to widen and increase public knowledge of fish foods, their value in the diet, and methods of preparing them; it is for the trade to seize the enlarged marketing opportunities thus created. If this is done, a good deal will be accomplished toward the solution of the fishing industry's difficulties, for expanded market is the great need.

### INSPECTION OF FISHERIES PRODUCTS

Inspection of fish foods under acts and regulations administered by the department makes for improvement in standards of production and therefore it has the effect also of helping to increase trade in these commodities. Inspections are made under the Fish Inspection Act, in the case of certain pickled and smoked fish and in the case of oysters. Canned salmon and other cannery products are inspected under the authority of a part of the Meat and Canned Foods Act. Plants and operating methods, as well as products, are subject to inspection under the terms of the two statutes. Except in the case of canned salmon, the inspection service is performed as part of the work of the department's fisheries inspectors and these officers are prepared for this duty by special courses of study which they are required to take at stations of the Biological Board. A special system for the inspection of canned salmon in British Columbia, where practically all the Canadian production takes place, was set up in the summer of 1932 when an inspecting board was appointed consisting of men of long experience in the salmon trade. While the board rendered efficient and useful service, it had been recognized from the outset that as soon as possible men of scientific qualifications, independent of all connection with the trade, should be placed in charge of this particular work, and on April 1, 1936, the inspection of canned salmon was transferred to the Canned Salmon Inspection Laboratory, which the department is establishing at Vancouver. At the head of the laboratory staff will be Mr. F. Charnley, a thoroughly qualified chemist, who, for some years, has been attached to the staff of the Pacific Fisheries Experimental Station at Prince Rupert. Mr. Charnley, who was selected for the new position by the Civil Service Commission, will have as his senior assistants men who have taken university work in scientific subjects.

Inspection work of the past year is reviewed in more or less detail in Appendix No. 4 and need not be referred to here at any great length. It may be well, however, to set down the figures as to the quantities of products inspected during the calendar year 1935.

In the Maritime Provinces and the Magdalen Islands the fisheries inspectors passed upon 468,559 boxes and barrels of pickled mackerel, pickled herring, pickled alewives, smoked round herring, and fresh oysters. This work, of course, was done under the Fish Inspection Act. Empty containers intended for holding products covered by this Act are also subject to compulsory inspection and 78,512 barrels and boxes were inspected during the year.

The only British Columbia product to which the Fish Inspection Act applies is dry-salted herring, which is shipped to the Orient, and during the year 72,162 boxes of 400 pounds each were inspected by qualified officers.

The big inspection job on the Pacific coast, of course, is the examination of canned salmon. The number of cases inspected during 1935 was 1,490,851. Of this large quantity all save 43,827 cases were found to be fresh, firm, well packed, and in good merchantable condition and therefore eligible for certification. Of the 43,827 cases below certificate standard 41,625 were Grade B or second quality—that is, they were sound, wholesome, and fit for human food though not quite up to certificate requirements—2,073 contained “tips and tails,” and for that reason were not eligible for certificates, and only 129 cases were found unfit for use for food. Only 129 cases in all the 1,490,851 unfit for use, a most excellent showing.

## INSTRUCTIONAL SERVICES

Work among fishermen in southern British Columbia was added during the fiscal year to the instructional services which the department and the Biological Board make available to men of the fishing industry. In this instance, as will be seen by reference to Appendix No. 4, arrangements were made under which a four-day course of instruction was offered at Nanaimo by the staff of the Pacific Fisheries Biological Station. With 26 fishermen in attendance, representative of a half a dozen fishing areas, three lecture sessions were held daily and the subjects covered included the life history of several important Pacific fish, ocean conditions, certain phases of fish conservation, and so on. The success of the undertaking, and the interest shown by those in attendance, may be judged from the fact that at the close of the course there was a spontaneous movement to have another course given in the autumn of 1936.

On the Atlantic coast the plan of giving a course for fishermen at the Atlantic Fisheries Experimental Station at Halifax was continued, although reduction in funds made it necessary to shorten the session to three weeks. The fact that no less than 110 applications for enrolment were received indicates the value the fishermen have come to place upon these courses since they were established a few years ago. Unfortunately, the station's facilities are not adequate to take care of an enrolment of that size and a good many of the applications could not be accepted. However, the course proved very successful and the fishermen in attendance showed appreciation of the helpful instruction, which centered mainly about subjects having a direct practical bearing on fishing operations and fish handling and processing.

One of the most valuable branches of the educational services is that which consists of instructing fishermen, who desire such assistance, as to the best methods of preparing pickle-cured codfish, boneless fish, and dried codfish processed according to what is known in the industry as the "Gaspé cure." In carrying on this work expert instructors employed by the department aid the fishermen by demonstrations in processing as well as by giving oral information and advice. In some localities, where special conditions have existed, the instructors have also been able to help the fishermen by demonstrating the most efficient methods of setting and handling fishing gear. The work which had been done by these men in previous years had been notably useful and it is gratifying to report that its extension during the past year to some fishing areas which had not hitherto been reached was equally successful.

As in earlier years the instructors in "Gaspé cure" operations carried on work in the Magdalen Islands and in Gloucester county, New Brunswick, during the year just closed. Sixteen or seventeen fishing settlements in the Magdalens and a similar number in Gloucester county were visited regularly during the cod season. Instructors in cod pickle curing extended their work to some places not previously covered on the eastern mainland of Nova Scotia and to a number of Cape Breton communities. As a result of their efforts the manufacture of boneless cod was begun at several points in Cape Breton, at two or three points on Nova Scotia's eastern mainland, and at two places in the western part of the province. The output from the operations at these places was marketed within Canada so that there was no interference with the important trade with the United States which western Nova Scotia producers of boneless fish have been carrying on for years.

## EXPANSION OF OYSTER FARMING

Accompanying Appendix No. 6 of this report is a table which shows in statistical terms the measure of success achieved so far in the department's effort to establish commercial oyster culture on a sound basis in Prince Edward Island and those who consult it will see that very gratifying progress has been



made. Areas for use as oyster "farms" in Prince Edward Island were first offered for leasing by the department in the autumn of 1931 and by reference to the table it will be seen that the number of areas leased and under cultivation increased from 26 in 1932 to 140 in 1935. Similarly, the sale of oysters from these grounds was only 92 barrels in 1933 but in 1935 it was 1,001½. The energy and the increasing interest of the lessees or "farmers" is also indicated by entries in the table which show that the quantity of small oysters, unsuited for sale, which they planted on the beds to aid in building up a greater producing and marketable stock jumped sharply from 254 barrels in 1932 to 1,038 barrels in 1933 and exceeded 2,100 barrels in each of the following two years.

As told by statistics, the story of what has been accomplished is one which gives much cause for satisfaction and encourages lively hope for the future of oyster farming in the province. However, as pointed out by Dr. A. W. H. Needler, who has been in charge of the oyster investigations and experimental work for the department, much of the development which has taken place cannot be readily or adequately expressed by figures alone. "Taking into account the high proportion of lessees who are just starting and are working as yet on an experimental scale," says Dr. Needler, "the time and money spent (by lessees in developing their grounds) is very encouraging." Continuance of the same spirit will mean steady enlargement of the production of oysters in the province, where, of course, there is an important public fishery in addition to the operations by the "farmers."

So far as market is concerned, it may be pointed out that even in the Dominion alone, to say nothing of the great sales opportunities offered in export countries, there is demand for a much larger quantity of oysters than is available from Canadian sources, notwithstanding that there are producing beds in British Columbia as well as in each of the three Maritime provinces. The fact of the matter is that shipments of oysters make up one of the larger items in Canada's import trade in fisheries products. When some demand and foreign requirements are kept in mind it will be seen that increase in the production from Prince Edward Island "farms" will bring no danger of over-supply. Indeed, there is such a gap between Canadian demand and total annual Canadian production that it may be that oyster "farming" would also prove profitable in other provinces, although it must be kept clearly in mind that the suitability of any locality for commercial oyster culture can only be determined by thorough investigation and experiment by fully qualified experts.

Since the history of the department's Prince Edward Island effort is summarized in Appendix No. 6 it need not be reviewed here. Perhaps, however, it may not be amiss to quote from the appendix a paragraph which not only puts into the words of a general statement what is expressed in another way in the statistical table but also indicates the department's aims and some of the problems which departmental activities are designed to meet: "The oyster farming industry is now established and growing rapidly. The actual expansion has been retarded by a number of factors (delays in surveying, scarcity of funds, etc.) and does not do justice to the increasing interest being taken both on the part of lessees and of prospective applicants. The industry has reached the stage where the first or most enterprising lessees are demonstrating that private oyster culture is profitable and increased interest and effort are resulting. It is at a stage where every effort must be made to facilitate the expansion so that the interest will not be discouraged. There must be an effort to meet the growing demand for stock for planting. The development of improvements in oyster cultural methods must be continued and the knowledge of the oysters and the conditions affecting their growth and reproduction must be made to keep pace with and in advance of a growing and changing industry. These are the aims of the department's experimental farming and related investigations and operations."



The work done at the department's experimental area in 1935 is, of course, reviewed in the appendix, which also deals with investigations continued or begun during the year in connection with various problems of moment to those engaging in oyster culture commercially. It will be seen that much attention is being given to the question of how best the increasing demand for oysters for planting purposes may be met and to the problem of developing the most efficient and most economical method for lessees to use in collecting and rearing spat. Progress is being made with both of them, as with other problems, but both require further study.

*Bras d'Or Situation.*—In addition to the work done during the past year in Prince Edward Island, where control of the oyster areas rests with the department, some investigation was carried on in the Bras d'Or Lake district of Cape Breton where, in the previous year, a preliminary survey of oyster conditions was made at the request of the Nova Scotia authorities, who have jurisdiction over the oyster beds of the province. The 1935 work, limited by considerations of time and expense, was supplementary to the examination made in 1934 but it will be seen from Appendix No. 6 that Dr. Needler inclines to the view that no great development of the industry is possible in the Bras d'Or waters without more extensive study, which would include testing various methods of culture and their modification to meet local conditions.

### FISH CULTURAL WORK

During 1935 there was a distribution of 145,878,304 eggs, fry, etc., from the fish cultural establishments operated by the department. As compared with hatchery output in the preceding year there was an increase of more than 60 per cent. Twenty-three hatcheries were under operation, 11 subsidiary hatcheries, 9 salmon retaining ponds, and several egg collecting camps. Included among them were two hatcheries and one sub-hatchery which for several years past the department has been conducting in Alberta national parks but at the expense of the National Parks branch of the Department of the Interior.

Leaving aside what is done in Alberta for the National Parks branch, the department's fish cultural work is confined to British Columbia and the Maritime Provinces where the fisheries are under federal administration. In the other provinces the fisheries are administered by the respective provincial governments and fish culture is in their hands.

The departmental hatcheries and other fish cultural facilities in the Maritime Provinces propagate and distribute such fish as speckled, rainbow and Loch Leven trout and Atlantic salmon and sebago or landlocked salmon. The fish dealt with in western operations include several species both of salmon and trout, among them steelhead, Kamloops, brown, speckled, cutthroat, and salmon trout, and sockeye, spring, coho, and Atlantic salmon. A full review of the department's work in the fish culture field during 1935 will be found, however, in Appendix No. 3 of this report.

### FISHERIES RESEARCH

One of the more important achievements of the staff of the Biological Board in carrying on fisheries research in 1935 was the development of a new type of ice-glaze for use in coating frozen fish which are to be held in cold storage. This was accomplished at the Pacific Fisheries Experimental Station conducted by the board at Prince Rupert, B.C. Glazes commonly in use have tended to crack and in some other respects as well they have perhaps not been wholly satisfactory. The Prince Rupert glaze, on the other hand, is flexible and does not crack easily. It is also mildly antiseptic. The expectation is that the station's success in perfecting it will be of a good deal of benefit to the frozen fish industry.

The development of the improved glaze is cited here simply as an example of the work which is being done in the interests of the fishing industry through scientific research carried on by the board, which is under the control of the Minister of Fisheries. Numerous other examples could, of course, also be mentioned—as, for instance, studies of water temperatures, movements, and salinities off the coast of Nova Scotia. Studies of that kind might seem to the layman to be of nothing more than academic interest but, in reality, they may be of a great deal of value to the fishermen by helping to determine where and under what conditions certain species of commercial fish, such as cod and haddock, are likely to be taken in largest quantities. However, since the Biological Board publishes its own annual review of its work it is not necessary to do more in this departmental report than to indicate some of the more important research carried on during the past year, and this is done in Appendix No. 2. Persons desiring copies of the board's account of its staff's investigations and experiments in 1935 should apply to Dr. A. G. Huntsman, editor of publications for the board, University of Toronto, Toronto.

### CONDITIONS IN THE LOBSTER FISHERY

Since 1932 there has been a decrease each year in the total lobster landings on the Atlantic coast, which is the Dominion's producing area, and this condition is one which suggests the wisdom of having a comprehensive study made of the lobster resources and fishery so that it may be ascertained whether new conservation measures are necessary and, if so, what they should be and how they might most effectively be applied. To point out the desirability of such a study is not to ignore the very useful lobster research work which has already been done by Canadian investigators, nor is it to take up an alarmist position as regards the future of the fishery. As regards previous research it may be said that there has scarcely been a time for a good many years past when lobster studies have not been in progress under federal auspices. They have brought out a substantial body of valuable information. These studies, however, have been concerned with particular questions related to the lobster stocks and fishery or with questions touching conditions in particular lobster fishing regions. What is now needed is a more comprehensive investigation covering all phases of the subject. Plans are accordingly being made to have such an investigation begun by the Biological Board during the coming summer.

At the same time, it is well to make it clear, lest anyone jump to conclusions too hastily, that while recent decreases in total lobster catch emphasize the need for further and more complete research it is not to be assumed that their occurrence necessarily means that the lobster stocks are diminishing. Although it may be that the increased intensiveness which has taken place in lobster fishing in the past five or six years has been putting too great a strain upon the resources, lessened catch since 1932 is not conclusive evidence as to that, for in all fisheries fluctuation in landings is a common state of affairs. A statistical graph which is printed on page 51 of this report bears on this question of fluctuation and it is especially pertinent here since it has to do with production from Canada's lobster fishery from 1922 to 1935 and shows that there were ups and downs in catch all through those years. Moreover, if the graph had covered a period going back further than 1922 it would have shown that in the earlier years, too, there were seasons of decreases and seasons of increases.

By reference to this graph it will be seen that in the Maritime Provinces and the Magdalen Islands the lobster catch dropped sharply in 1924. (Landings by fishermen of Quebec's mainland sea counties are not shown on the graph, which deals only with the results of fishing in areas where the fisheries are under federal administration, but much the greater part of the provincial lobster catch in Quebec is taken off the Magdalens). In 1925 the catch total



for the Maritime-Magdalens region moved up again. In the next two or three years the trend was not uniform throughout the region but from 1928 onward there was a steady and general rise in catch, except in the Magdalens in 1931, until a high peak was reached in aggregate landings in 1932. Since then the total production has gone down, although 1934 catch was somewhat larger in Nova Scotia and the Magdalens than it had been in 1933.

In the light of what the graph reveals as to changes in catch levels between 1922 and 1935, and keeping in mind also that there were similar variations prior to 1922, it would be quite unjustifiable to assume that the decreases of the past three years are a positive indication that the lobster stocks are diminishing. Statistics are very useful but they are not necessarily conclusive in a case of this kind. Nevertheless, the lobster fishery is of such great importance to the Atlantic coast, and, indeed, to the nation, that it would be rash to ignore what has recently been taking place. The fishery is the most valuable single fishery of the Atlantic region, both from the standpoint of the annual marketed return which it yields and from the standpoint of the employment which it gives. As a matter of fact, moreover, the lobster ranks second only to British Columbia's salmon among all the fisheries products of the Dominion, so far as yearly marketed value is concerned. Under the circumstances it is obviously of prime importance that nothing be left undone that may be necessary to the adequate protection of the lobster resources.

### ATLANTIC SALMON STOCKS

Attention is directed to statistical graphs appearing in the latter part of this report which show the catch trend in the commercial salmon fishery on two sections of the Atlantic coast. While they are based upon figures of commercial production the graphs should be of great interest to anglers, not only to the fishing industry, because of what they indicate as to the maintenance of the salmon stocks. The Atlantic salmon (*Salmo salar*) is important commercially but it is also first among the sport fishes of Canada's eastern coast provinces.

One of the graphs shows what Nova Scotia's commercial catch has been annually during the period from 1870 to 1934. The other shows annual catch in the Gulf of St. Lawrence area of the Maritime Provinces and Quebec, beginning with the fiscal year 1912-13 and ending with the calendar year 1934. It may be noted, however, that as Atlantic salmon are not taken in winter fishing the catches which the graph credits to fiscal years are in reality calendar year totals; that is, for example, catch shown for 1912-13 was taken in the 1912 part of the fiscal year.

By a glance at the Nova Scotia graph it will be seen that there was apparently a great decrease in catch between 1874 and 1881 and that sharp rises and sharp falls then followed until the middle or late '90's. In this connection it is not unfair to say that production figures for these earlier periods should probably be accepted with a good deal of reserve. Those were years when statistics were not given the same value as nowadays and collection methods were doubtless more or less haphazard. However that may be, the graph reveals that since the '90's the trend of Nova Scotia salmon catch has been generally upward. In 1930 the landings reached the highest level in over forty years. There have been sharp downward fluctuations during the period, it is true—a very sharp fluctuation between 1917 and 1920, for instance, and another which set in during 1931, both of them possibly explained by the theory held by some scientists that there are periodic "depressions of abundance" which occur, on the average, every 9-6 years—but, in general, the trend has been upward.

The St. Lawrence area graph does not cover so long a time as the other. Nevertheless, it tells much the same story so far as production from the gulf



region between 1912 and 1934 is concerned. There, as in the case of Nova Scotia, and part of Nova Scotia's catch, of course, is taken from gulf area waters, the catch trend has been generally toward higher levels.

The significance of the graphs is that they indicate that the salmon stocks have not been diminishing in the past 40 years or so but that such change in abundance as has been taking place has been in the way of increase. Greater intensiveness of fishing effort has, of course, made for increase in catch but, on the other hand, if salmon stocks had not been keeping up and had not been able to stand the fishing drain there could not have been a continuing rise in the production curve over an extended period of years. Needless to say, this is not to assert that it is not necessary to continue adequate protection of the fishery and sound regulation of fishing operations. A fishery of such importance must always be watched carefully and there must be alertness in seeing that it is properly safeguarded. At the same time, so far at least as regards the areas they cover and the period up to the end of 1934—and these areas account for much the larger part of the total Atlantic catch—the graphs make it clear that failure of anglers or commercial fishermen to make satisfactory catches in particular localities has not been due to reduction in salmon supply but to other conditions.

A further word may be said as to what has been happening in connection with salmon angling. Statistics of angling catch are much less complete than those of commercial production but it is apparently true that in many salmon streams in more recent times the anglers have not been as successful, especially in the earlier part of the season, as sportsmen of former years. The explanation of this condition has been under investigation and it is still being studied. There is reason to believe, however, that the condition is mainly due to factors which have affected the flow and temperature of the river waters and much of the responsibility can be placed upon the destruction of forests by lumbering operations and fires. Forest denudation has affected water flow and with it water temperature. In turn the movement of salmon up the river is affected. The fish wait, of course, for suitable water conditions before making the ascent. What is evidently happening, in general, is that they go upstream later in the season than was formerly the case and the early anglers, at least, find fewer fish to be taken, although in reality the run for the year is normal. The fact that the graphs of commercial catch show that salmon stocks are not diminishing supports the view that any adverse change which has been taking place in angling conditions is due to other factors than diminished abundance of fish in the rivers.

### FISHERIES INTELLIGENCE

Experience having demonstrated the usefulness of special broadcasts arranged by the department in order to supply Atlantic coast sea fishermen with weather reports and messages as to bait and ice conditions, this radio service was continued during the past year. A service of this kind is not required on the Pacific coast where fishing conditions are different from those in the Atlantic area.

The weather forecasts were broadcast twice daily from Saint John, N.B., Louisburg, N.S., and Halifax, N.S., throughout the year and except in some of the winter months the ice and bait reports were included in the messages from Halifax and Louisburg. These latter reports are not required in the district served by the Saint John station nor are they needed in the winter season. All of the messages sent out during the time that the departmental ship *Arras* was on the banks with the Nova Scotia fleet were rebroadcast from that vessel.

The reports as to bait and ice were made up in the department's divisional headquarters office at Halifax and transmitted to the broadcasting units. They were based upon information telegraphed to Halifax each day by departmental inspectors in different parts of Nova Scotia and in the Magdalen Islands so that the broadcasts gave the fishermen the latest possible advices from a wide area.

During part of the summer season some material for inclusion in these reports was also obtained from Newfoundland through the courtesy of the island's administrative authorities. The weather reports were supplied by the Meteorological Service of the Department of Marine.

Collection and checking of the statistics of fisheries operations in all parts of Canada where the fisheries are under federal administration are an important part of the department's work. This work is carried on under the Fisheries Intelligence and Publicity Branch but the actual collection of statistics is done by the Fisheries Inspectors on the department's staff in different parts of the country. By employing the inspectors in this service, and, of course, these officers have various other duties, the added cost of creating and maintaining special machinery for the collection of fisheries statistics at government expense is avoided. The present system has the further advantage of putting collection in the hands of officers fully acquainted with fisheries matters.

Statistics are collected both on a monthly basis and annually. The monthly figures, which are made public through the Fisheries News Bulletin, are useful as enabling the department and the fishing industry to know the trend of production from time to time, although, admittedly, they are not so nearly accurate as the annual statistics, which can be subjected to close checking and revision. The annual figures, based in part upon returns prepared by the fisheries inspectors and in part upon schedules which operators in the industry are required to fill in, are compiled at the Dominion Bureau of Statistics and used in the yearly volume, "Fisheries Statistics of Canada," which is issued by the bureau in co-operation with this department and provincial departments concerned with fisheries matters.

Publication of the Fisheries News Bulletin in both English and French editions continued to serve useful purposes during the year. At a time when outlays have had to be kept to a minimum the News Bulletin has been at once an economical and effective means of acquainting the public and the press with information of value to them as to fisheries matters. It is a bulletin, not of propaganda, but of information likely to be of interest and value to Canadians and at the same time it serves to bring to their attention the importance of the fishing industry from the national point of view. The frequent use which newspapers make of material from it is one indication that the bulletin is of real service.

However, while a good deal of information is disseminated by means of the bulletin there are, of course, very many requests made of the department for other material. They have been increasing. Some of them can be met by supplying departmental publications, although the need for economy in recent years has restricted the number of papers prepared by the department. Many of the requests, however, can only be dealt with satisfactorily by correspondence covering the particular points raised. During the past year the inquiries received covered a wide range, including among them, in addition to many from teachers, school pupils, newspapers, etc., requests from persons engaged in the fishing industry for advice on various subjects connected with their operations or for information as to market outlets. Requests of this latter class when relating to domestic outlets are dealt with by the department, which keeps on record lists of Canadian wholesalers of fish and operators of retail fish markets; when relating to foreign markets the requests are dealt with in co-operation with the Commercial Intelligence Service of the Department of Trade and Commerce, with which the Fisheries Intelligence and Publicity Branch maintains close contact.

### INCREASED SEALING REVENUE

Under the Pelagic Sealing Treaty the Dominion shares in the returns from the capture of fur seals on the Pribilof Islands and on certain Japanese rookeries and in the fiscal year 1935-36 the Canadian revenue thus obtained was \$113,-594.61. This sum exceeded by over \$24,000 the revenue from the same source



in the preceding year and it was more than double the receipts in 1933-34 when they totalled only \$52,466.26. In the main, of course, the rise in revenue is due to the increase which has been taking place in seal skin prices in the past few years. Prices have now reached the highest level in some time and in this connection a reference to the average net returns per skin which Canada has been receiving from sales in London is of interest.

The first skins which the Dominion marketed in London were 8,185 taken by the United States Government on the Pribilof Islands in 1933 and delivered to Canada under the provision of the Pelagic Sealing Treaty entitling this country to fifteen per cent, in number and value, of the annual take of skins on the Pribilof rookeries where seal hunting is in the hands of the United States authorities. The average net return to Canada from London fur sales at which these skins were offered was \$8.29 per pelt. Next, 8,025 skins from the 1934 Pribilof kill were marketed in London, where, from the outset of the plan of selling in Britain, Canada's skins have been handled by Messrs. C. M. Lampson and Company, Limited. The average net return in this instance was \$10.64. Last January 1,998 Pribilof skins, a portion of those which had been obtained in the 1935 hunt, were offered by the Dominion in London and they brought an average net of approximately \$16.40. In April, 1,872 more skins were sold and they brought the Dominion about \$19.03 net, on the average, but, of course, the receipts from this sale will go into the revenue for the fiscal year 1936-37.

The largest item entering into fur seal receipts of the last fiscal year was one of \$89,160, roundly stated, which was the net amount received from the sale of 6,608 Pribilof skins which the Dominion marketed in London during the year. Most of these skins, though not all, had been obtained from the 1935 kill. Another large item in the receipts, \$23,360 was the amount obtained from the sale in Seattle of 2,000 of the skins handed over to Canada by the United States from the 1935 hunt. While it is the policy of the Canadian Government to sell most of its share of the Pribilof skins in London, an opportunity offered last autumn to dispose of 2,000 salted skins in the United States on satisfactory terms and, after consultation with the Lampson firm, which is in close touch with fur market conditions generally, it was decided to take advantage of it.

Japanese payments to Canada on fur seal account during the fiscal year totalled \$1,029.87. Under the sealing treaty the Dominion is entitled to ten per cent, in number and value, of the annual take of skins on Japanese rookeries and the payments received in 1935-36 represented the proceeds from the sale of 370 skins—170 Canada's share of the 1933 Japanese kill and 200 the Canadian share of the 1934 kill.

### FISHING BOUNTY PAYMENTS

Fishing bounties totalling \$159,966.20 were paid on the Atlantic coast during the year to 11,898 fishing boat owners, 21,227 boat fishermen, 600 fishing vessels and 3,378 vessel fishermen, under authority of "An Act to Encourage the Development of Sea Fisheries and Building of Fishing Vessels." Bounty payments are made each year and are shared by boat and vessel owners and fishermen in all four Atlantic provinces, but only craft and men engaged in the sea fisheries are eligible to receive bounties.

The basis of distribution for the season of 1935 was as follows: To the owners of vessels entitled to receive bounty, \$1 per registered ton, payment to the owner of any one vessel not to exceed \$80; to vessel fishermen entitled to receive bounty, \$6.30 each; to owners of boats measuring not less than twelve feet keel, \$1 per boat; to boat fishermen entitled to receive bounty, \$5.45 each. The payments to owners of vessels and boats were on the same scale as during the season of 1934, but, in the case of fishermen, the bounties were slightly higher in 1935 than the preceding year.



By provinces, the total payments during 1935 were as follows: Nova Scotia, \$74,842.95; Quebec, \$49,133; New Brunswick, \$23,174.50; Prince Edward Island, \$12,815.75. It is to be noted, however, that the money paid during the past year included several amounts—their total was \$1,880.45—covering "late" claims arising out of the 1934 season.

Details of the 1935 distribution are shown in the following table:—

1935-36

Province and County	Boats	Men	Amount	Vessels	Tons	Average Tons	Men	Amount	Total Amount
			\$ cts.					\$ cts.	\$ cts.
<i>Nova Scotia—</i>									
Annapolis.....	160	265	1,604 25	2	31	15	14	119 20	1,723 45
Antigonish.....	199	297	1,817 65	.....	.....	.....	.....	.....	1,817 65
Cape Breton.....	540	993	5,951 85	26	348	15	85	883 50	6,835 35
Cumberland.....	4	5	31 25	.....	.....	.....	.....	.....	31 25
Digby.....	413	743	4,462 35	4	55	13	15	149 50	4,611 85
Guysboro.....	677	1,085	6,590 25	23	291	13	95	889 50	7,479 75
Halifax.....	881	1,313	8,016 85	46	576	13	174	1,672 20	9,689 05
Inverness.....	187	354	2,109 30	4	44	11	18	157 40	2,266 70
Kings.....	77	113	692 85	.....	.....	.....	.....	.....	692 85
Lunenburg.....	604	795	4,936 75	95	4,330	45	1,162	11,650 60	16,587 35
Pictou.....	17	25	153 50	.....	.....	.....	.....	.....	153 50
Queens.....	184	228	1,426 60	12	157	13	61	541 30	1,967 90
Richmond.....	346	604	3,637 80	4	55	13	16	155 80	3,793 60
Shelburne.....	762	1,284	7,759 80	29	828	28	242	2,352 60	10,112 40
Victoria.....	353	575	3,475 75	9	134	15	29	316 70	3,792 45
Yarmouth.....	160	373	2,192 85	8	276	34	130	1,095 00	3,287 85
Totals.....	5,564	9,052	54,859 65	262	7,125	27	2,041	19,983 30	74,842 95
<i>New Brunswick—</i>									
Charlotte.....	160	267	1,615 50	1	11	11	2	23 60	1,639 10
Gloucester.....	589	1,200	7,129 00	209	3,660	17	940	9,582 00	16,711 00
Kent.....	200	371	1,225 30	8	84	10	20	210 00	1,435 30
Northumberland.....	119	259	1,530 55	63	674	10	150	1,619 00	3,149 55
Restigouche.....	14	21	128 45	.....	.....	.....	.....	.....	128 45
Saint John.....	13	18	111 10	.....	.....	.....	.....	.....	111 10
Totals.....	1,095	2,136	11,739 90	281	4,429	15	1,112	11,434 60	23,174 50
<i>Prince Edward Island—</i>									
Kings.....	241	380	2,296 20	.....	.....	.....	.....	.....	2,296 20
Prince.....	650	1,281	7,631 45	.....	.....	.....	.....	.....	7,631 45
Queens.....	292	458	2,788 10	3	37	12	10	100 00	2,888 10
Totals.....	1,183	2,119	12,715 75	3	37	12	10	100 00	12,815 75
<i>Quebec—</i>									
Bonaventure.....	640	1,068	6,429 10	11	111	10	34	325 20	6,754 30
Gaspe.....	2,660	5,438	32,297 10	43	479	11	181	1,619 30	33,916 40
Matane.....	154	279	1,674 55	.....	.....	.....	.....	.....	1,674 55
Saguenay.....	602	1,135	6,787 75	.....	.....	.....	.....	.....	6,787 75
Totals.....	4,056	7,920	47,188 50	54	590	10	215	1,944 50	49,133 00
Grand totals.....	11,898	21,227	126,503 80	600	12,181	20	3,378	33,462 40	159,966 20

NOTE.—A number of "Late" claims amounting in all to \$1,880.45, which are included in the above statement, are for the season of 1934. As the basis of distribution for 1934 differed from that of 1935 a number of the figures indicated in the "Amount" columns do not balance with the number of claims paid.

### INTERNATIONAL FISHERIES COMMISSION, 1935-36

During the year the International Fisheries Commission continued the investigation of the life-history of the Pacific halibut and the observation and regulation of the fishery, as provided in the treaty of May, 1930, between Canada and the United States. The investigation proved that, under regulation, the condition of the stocks on the banks has continued to improve.

The commission continued to maintain close contact with all branches of the halibut industry. A public hearing was held at Prince Rupert on December 4 and 5, and another at Vancouver on December 7. Meetings were held at Seattle on February 19 and 20 with the Conference Board, composed of representatives of the different sections of the fishing fleet. Informal meetings were held at different times throughout the year with various committees and individuals. At the hearing and meetings, the results of the commission's investigations were explained and the problems of the fleet were presented and discussed.

The 1935 fishing season opened on March 1, as in the preceding year. The catch limits set by the commission for Areas 2 and 3 were unchanged. The limit placed on Area 1 during 1934 was discontinued—the closing date for the area being made the same as for Area 2.

As a result of improved fishing conditions and in spite of voluntary curtailment of production by the fishermen, and a strike which delayed fishing operations at the beginning of the season for more than one month, the catch limit in Area 2, which includes the grounds off southeastern Alaska and British Columbia, was reached early in September. Areas 1 and 2 were closed at midnight of September 6, with catches of approximately 567,000 and 22,028,000 pounds, respectively. Areas 3 and 4 were closed at midnight of December 26, with catches of approximately 23,732,000 and 906,000 pounds, respectively.

The scientific investigations by the staff were pursued where necessary for the purposes of the treaty. They included the collection and analysis of the statistical and biological data, whereby the success of regulation can be determined and on which intelligent control must be based. The collection of the biological data made necessary the operation of a vessel.

The regulation of the fishery produced a further improvement in the condition of the halibut stocks. The abundance of fish, as indicated by the catch in pounds per standard unit of gear fished, increased from 55.0 to 61.1 pounds in area 2 and from 85.6 to 88.0 pounds in Area 3. The abundance of fish was shown to be 76 per cent greater in Area 2 and 37 per cent greater in Area 3 than it was in 1930, when the abundance of halibut reached its lowest ebb. (A reference to the last annual departmental report will show that it was stated, page 29, that the average catch per unit of gear in Area 2 in 1934 was 56.4 pounds and in Area 3 it was 87.2 pounds. The apparent discrepancies between those figures and the figures given for 1934 catch in the present paragraph, 55.0 and 85.6 pounds are due to the factor that prior to 1935 a consistent series of abundance data was maintained, in spite of changes in the regulatory areas, but that in 1935 it was decided to revise them so that the values would apply exactly to the areas as defined in the 1935 regulations. The 1934 data now given are the revised values and they are correct for Areas 2 and 3 as now defined and are comparable with the 1935 values given).

Accompanying the changes in abundance, the proportion of "medium" and "large" increased in the landings and that of "chickens" and "baby chickens" decreased. These changes in the composition of the landings were expected on theoretical grounds, as a result of regulation, and indicate an increase in the abundance of halibut of spawning size.

Market measurements, which are a recognized method of detecting changes in the composition of the stock, were continued. More than 100 trips were sampled, involving the examination and measurement of about 80,000 fish. The results showed a small increase in the average size of fish caught on the southern grounds and, in conjunction with the general increase in abundance, proved that the abundance of spawning halibut is increasing. This should be accompanied by an increase in the production of spawn and in due time should produce an increase in the numbers of young fish entering the fishery.



Study of age, rate of growth and age composition of the stocks was also continued. Data collected prior to the inauguration of regulation were analyzed as a basis for the determination of changes produced by regulation. Current material for the determination of age composition was collected in conjunction with the taking of market measurements.

Uncertainty regarding the percentage loss of tags from the halibut marked by the commission led to experiments by which the loss might be determined. During a fishing trip of the halibut boat *Hoover* to Goose Island grounds, in May, about 600 halibut were marked with metal tags similar to those used in the past. Fifty per cent of these fish were also marked by tattooing. Since to the end of the fishing season the tattoo marks were still very conspicuous, and as no fish bearing tattoo marks were returned without metal tags, it seems certain that the metal tags are not lost from the fish in any numbers. This indicates that there is little error in the use of the results of the commission's marking experiments to determine the rate of removal of the fish by the fishery.

Particular attention was devoted to the study of the production of spawn, since conclusive proof of improved spawning conditions can best be obtained by the actual measurement of the changes as they occur. The analysis of previously collected material was completed, three reports bearing directly on the problem were prepared and published, and the observation of spawning in the waters off the coast of British Columbia was continued.

Analysis of the results of the net hauls made from the beginning of December, 1934, to the end of February, 1935, in the vicinity of the Queen Charlotte islands, indicated the presence of a greater abundance of eggs than during the spawning seasons of the preceding years. In about five years the improvement should be reflected in the commercial fishery by an increase in the number of small fish.

The investigation of spawning in British Columbia waters was continued in January and early February, 1936, when the halibut schooner *Eagle* was chartered and operated in the neighbourhood of Cape St. James. Net hauls were made at a considerable number of stations to determine the abundance of eggs. Hydrographic sections were taken and drift-bottles were released to determine the currents that distribute the eggs and larvae. A preliminary survey of the results of the net hauls indicated the presence of a considerable abundance of eggs. More detailed examination will need to be made to determine whether there was an improvement over the preceding year.

A variety of subjects, all closely related and essential to the study of the production of spawn, are dealt with in Commission Report No. 9. The known distribution of the halibut throughout the world is described and the discovery of any extensive new halibut banks is shown to be extremely unlikely. Detailed descriptions of the halibut egg and all stages of the embryo and larva, necessary for their identification in the study of their abundance and distribution by the ocean currents, are given. The drift of the eggs and larvae off the west coast of North America is described, and the complete separation of the stocks on the banks off the British Columbia coast from those in the gulf of Alaska is proved. The abundance of eggs produced in the waters off the coast of British Columbia is shown to be about one-thirtieth as great as in the gulf of Alaska. The theory underlying the effect of various intensities of fishing upon the abundance of fish is given further consideration, and it is shown that the effect of small changes in the intensity of fishing may cause great changes in the production of spawn. Finally, by analysis of the results of drift bottle experiments, the seasonal variation is shown in the position of splitting of the so-called "Japanese Current," which has an important effect on the distribution of eggs and larvae.

An account of the hydrographic work carried on by the commission's staff during the spawning season of 1929 is contained in Report No. 10. The currents in the gulf of Alaska are calculated. The results are a valuable addition to



the knowledge of the currents by which the eggs and larvae are distributed on that part of the coast.

The results of an investigation into the specific characters suitable for the separation of the young of a number of species of flatfish occurring in the North Pacific are given in Report No. 11. Data and keys necessary for the positive identification of the halibut larvae are presented.

The investigations of the commission during the past year explained the changes taking place in the stocks of halibut on the banks. They proved that the condition of the stocks continued to improve, as a result of regulation, and gave sound reasons for the relief that the total yield can be increased by continued regulation.

### NORTH AMERICAN COUNCIL

The North American Council on Fishery Investigations held its annual meeting for 1935 on September 17, 18, and 19 at Washington, D.C., Canada being represented by Dr. A. G. Huntsman, Consulting Director of the Biological Board, and the undersigned. The United States was represented by F. T. Bell, Commissioner of Fisheries, Dr. H. B. Bigelow (Chairman), Director of the Woods Hole Oceanographic Institution, and Elmer Higgins, Chief, Division of Scientific Inquiry, Bureau of Fisheries. Since neither France nor Newfoundland was able to send representatives, the meeting was largely confined to consideration of the activities of the United States and Canada in investigations of fisheries in international waters and of common interest. The council was assisted in its work by the presence of fifteen advisers (principally scientists engaged in investigations in fields surveyed by the council), of whom five were from Canada.

The situation in the *Haddock Fishery* has been of particular concern in recent years, and reports have been presented on its various aspects by the investigators of the United States, Canada and Newfoundland. A fishery worth more than \$4,500,000 to the fishermen in 1933 is facing commercial destruction. Otter trawling vessels operating on the New England banks have been removing so many fish that the average catch per vessel in 1934 was only one-third of that in 1927. As a consequence, the trawlers have been shifting their activities to the Nova Scotian banks, which seem likely to suffer the same fate as those of New England. In 1934 the New England fleet took 66 per cent of its haddock from the Nova Scotian banks, and in the first seven months of 1935, 75 per cent. From known movements of the fish, this is to be expected to affect definitely the shore fishery for haddock of Nova Scotia in particular.

As the investigators of the United States have found that there is a very great destruction of undersized, unmarketable fish in the trawling (up to two-thirds of the total caught), and that by the use of a net with larger mesh the great majority of these young fish would be permitted to escape, the council recommended "that the United States and Canada endeavour by joint convention to limit the mesh of otter trawls used in the haddock fishery as follows: no mesh to be less than 4½ inches between knot centres (stretched mesh, new netting, the measurement to be the average of at least ten consecutive meshes) in any part of the trawl except the belly and the after part of the cod end."

The council has endeavoured to stimulate investigation of the relation of varying water or hydrological conditions to the fisheries, the water temperature being considered as of special importance in affecting the fishermen's catches. This is particularly evident in the *Cod Fishery*, and to the north. Newfoundland has found that a rise or fall of from 3° to 7° F. is sufficient to cause scarcity of cod and that the "Gulf" type of codfish occurs in much warmer water than the "Banks" or "Labrador" type. As predicted, increase in the Labrador current gave in 1935 cold water (mostly below 36° F.) on the Grand bank with larger catches of cod but the lower temperature in the strait of Belle Isle resulted in a catch there of Gulf cod definitely below that of the previous year, 1934. The effect of the increase in the Labrador current extended

to the Nova Scotian coast, where the Canadian investigators found an extensive mass of ice-cold water affecting the fishery even to the southwest of Halifax, greatly decreasing the spring (April-May) run of cod to the shore grounds, from Halifax to Prince Edward Island, but giving very good fishing outside, on the Western bank, which continued six weeks later than ordinarily. In southwestern Nova Scotia and the bay of Fundy beyond the effect of the ice-cold water, the cod fishery was as good as usual, or better.

Prediction of the size of the fishermen's catch from year to year in so far as it depends upon the comparative abundance of the stock of fish in the sea has proved to be possible through determination each year of the relative numbers of individuals of the various year-classes, that is, ages. This is done by regularly examining the scales from sufficiently representative samples of the catch of each species of fish. This has been carried farthest by the United States in the case of the *Mackerel Fishery*, the prediction for the season of 1934 turning out to be essentially correct, with abundance of fish about 10 per cent greater than anticipated. The very successful fishery from New Jersey to Nova Scotia during the past eight years has been found due to the large numbers of the mackerel hatched in 1921, 1923, 1928, 1930 and 1931, and, unless other good years for successful breeding come along, the abundance of the fish and the catch will go down. For the *Cod Fishery*, Canada has found that on the Nova Scotian coast the stock of autumn-spawning fish has been kept up largely by the 1927, 1928, 1925 and 1926 broods, while those of 1923, 1919 and 1916 were particularly poor.

The North American Council has been in contact in Europe with the International Council for the Exploration of the Sea. The meeting of the latter body at Copenhagen in May, 1935, was attended by Dr. Bigelow and Dr. Huntsman, chairman and secretary respectively of the North American Council, which permitted much interchange of information on subjects of common interest. One of these is the *Geographical Coincidence in Abundance of Fishes*, between the two sides of the Atlantic as shown for particular year-classes of certain species of fish. At its September meeting the North American Council, realizing the importance of determining the causes of the fluctuations in abundance of commercial fishes, recommended to the countries represented in the council "that the cod, haddock, herring, mackerel and salmon be studied from the standpoint of geographical coincidence of especially rich and especially poor year classes in the western Atlantic, for correlation with similar studies on the same species undertaken in the eastern Atlantic by the International Council for the Exploration of the Sea."

The council has been concerned with the division of the international fishing grounds into precise areas for uniform use by the various countries of statistical reports of the fisheries. Definite limits for each of a series of major areas along the Atlantic coast of North America have been agreed upon, and steps are being taken to have each of these divided into suitable smaller areas fully taking into account the feasibility of collecting and publishing the *Fisheries Statistics* in accordance with this sub-division. The council has also sponsored the preparation of statistical accounts of the complete western North Atlantic catch of as many of the international fisheries as possible. One on the cod (O. E. Sette, *Statistics of the Catch of Cod off the East Coast of North America to 1926*) was published in 1928, one on the haddock (A. W. H. Needler, *Statistics of the Haddock Fishery in North American Waters*) in 1929, and one on the mackerel (O. E. Sette and A. W. H. Needler, *Statistics of the Mackerel Fishery off the East Coast of North America, 1804 to 1930*) in 1934. These are to be brought up to date in continuations, from time to time, and accounts of the halibut and of the pollock are in preparation.

Your obedient servant,

WM. A. FOUND,  
Deputy Minister of Fisheries.



## APPENDIX No. 1

### ANNUAL REPORTS FOR THE YEAR 1935 BY THE CHIEF SUPERVISORS OF FISHERIES

#### REPORT OF MAJOR D. H. SUTHERLAND, CHIEF SUPERVISOR, EASTERN DIVISION

After a period of three or four years of declining values the fisheries of the Eastern Division, comprising the Maritime Provinces and the Magdalen Islands, showed a marked improvement during 1934 when the marketed value increased by more than \$2,000,000 over the two previous years. This improvement was not carried into the year 1935, however, to the same degree but the ground then gained has been held and, notwithstanding a decreased catch, the marketed value for the past year shows an increase of almost \$1,319,759 over the 1934 figures.

The marketed value of all fisheries products during 1935 was \$13,639,431 compared with the following totals for the past six years:—

1934.....	\$ 12,786,565
1933.....	10,205,397
1932.....	10,914,282
1931.....	13,680,034
1930.....	17,026,470
1929.....	19,334,431

The total quantity of all kinds of fish, including shellfish, landed in the division during 1935 was 419,374,600 pounds with a landed value of \$7,572,299. These figures represent a reduction of 24,972,100 pounds in catch, as compared with the previous year's results, but landed value changed little. The decreased catch was due to a general falling off in the catch of lobsters, cod, mackerel, salmon and hake. There were substantial increases in the landing of haddock, herring, smelt and swordfish.

In Nova Scotia the aggregate catch decreased over 2,500,000 pounds owing mostly to lessened catches of cod, mackerel and hake, while in New Brunswick the production increased by 3,634,600 pounds when greater quantities of herring, smelt, cod and clams were landed. In Prince Edward Island the catch was less by 2,434,400 pounds than in 1934 and the Magdalen Islands' catch by 2,003,500 pounds. In these latter areas cod and lobster fisheries were not as successful as in the preceding year.

The lobster fishery was again the most important, so far as value is concerned, yielding almost \$4,400,000 or about one-third of the total value return from all the fisheries of the division. One of the outstanding features of the year's operations was the success of the hardine fishery of Charlotte and Saint John counties, New Brunswick, the marketed value reaching the high figure of \$1,335,279 as compared with \$1,038,189 in 1934 and \$622,531 in 1933. The increased value was due to the large pack of sardines in Charlotte county, where this industry enjoyed a most prosperous season. The entire output was sold and the canners are making preparation for a very active season in 1936. The catch of sardines was slightly less than in 1934.



## THE LOBSTER FISHERY

Since 1930 the lobster fishery of the division has been subjected to very heavy fishing. The number of fishermen has increased from 12,000 to over 18,000 and there has been a corresponding increase in the boats and fishing gear used. The catch over this period is as follows:—

1930.....	40,421,300 lbs.
1931.....	43,302,800 “
1932.....	47,852,100 “
1933.....	37,012,100 “
1934.....	35,658,800 “
1935.....	31,725,000 “

These figures indicate a gradual decline in production notwithstanding a greater fishing effort. This is particularly true of the gulf of Saint Lawrence area where the most intensive fishing is carried on during the spring season.

The catch in the division for 1935 was 31,725,000 pounds with a value to the fishermen of \$3,148,310 and a marketed value of \$4,350,443, the highest marketed value since 1932. Compared with the previous year the catch was 3,933,800 pounds less, with a decrease in landed value of \$17,539. The greater marketed value is due to higher price for both fresh and canned lobster.

Decreased catches were general in all parts of the division except south-western Nova Scotia and the Bay of Fundy, where size limits have been enforced for some years, but were most noticeable on the east coast of New Brunswick and in Prince Edward Island and the Magdalen Islands.

The pack of canned lobsters was 98,964 cases of 48 pounds each with a value of \$2,175,729 compared with 114,679 cases valued at \$2,349,164 during the previous year. Shipments of live lobsters in shell decreased by 491,100 pounds.

The following table shows the catch, pack, shell shipments and tomalley packed for the division by districts for the past three years:—

## CATCH

—	1935		1934		1933	
	Cwt.	Marketed Value	Cwt.	Marketed Value	Cwt.	Marketed Value
		\$		\$		\$
Nova Scotia.....	176,836	2,732,872	184,590	2,487,633	176,858	1,884,715
New Brunswick.....	54,831	818,699	65,073	812,045	74,940	830,363
Prince Edward Island.....	63,876	605,107	76,582	674,186	91,547	591,801
Magdalen Islands.....	21,707	193,765	30,343	240,640	26,776	175,545
Totals.....	317,250	4,350,443	356,588	4,214,504	370,121	3,482,424

## SHELL SHIPMENTS

—	1935		1934		1933	
	Cwt.	Marketed Value	Cwt.	Marketed Value	Cwt.	Marketed Value
		\$		\$		\$
Nova Scotia.....	90,840	1,652,082	91,418	1,365,094	84,271	1,087,770
New Brunswick.....	20,537	381,092	22,135	311,446	27,286	348,473
Prince Edward Island.....	2,991	32,430	3,546	38,704	9,568	71,258
Magdalen Islands.....			3,468	30,709	589	3,611
Totals.....	114,368	2,065,604	120,567	1,745,953	121,714	1,511,112

## QUANTITY CANNED

	1935		1934		1933	
	Cases	Marketed Value	Cases	Marketed Value	Cases	Marketed Value
		\$		\$		\$
Nova Scotia.....	46,863	1,021,258	50,553	1,036,487	50,729	754,590
New Brunswick.....	18,275	404,260	23,815	477,999	26,417	454,424
Prince Edward Island.....	25,170	556,596	30,214	624,771	32,895	512,138
Magdalen Islands.....	8,656	193,615	10,097	209,907	10,730	171,914
Totals.....	98,964	2,175,729	114,679	2,349,164	120,771	1,893,066

## TOMALLEY

	1935		1934		1933	
	Cases	Marketed Value	Cases	Marketed Value	Cases	Marketed Value
		\$		\$		\$
Nova Scotia.....	3,528	33,560	3,418	30,951	2,432	18,988
New Brunswick.....	617	4,497	479	3,200	236	1,825
Prince Edward Island.....	1,358	15,661	1,149	9,386	1,032	6,905
Magdalen Islands.....	15	150	4	24	4	20
Totals.....	5,518	53,868	5,050	43,561	3,704	27,738

## THE COD FISHERY

Fishing for codfish is carried on in every part of the division excepting the headwaters of the Bay of Fundy and along the Northumberland strait, but the heaviest producing areas are Lunenburg and Gloucester counties where the bank fishing fleets are centralized, and at Halifax, Lunenburg and Lockeport for the fresh trade. Owing to unfavourable market conditions and low prices the production from this fishery has declined greatly during recent years. In 1935 only 117,224,800 pounds were produced in the division whereas in Nova Scotia alone, 10 years ago, the catch was over 180,000,000 pounds.

The 1935 catch shows a decrease of 9,219,800 pounds, as compared with the previous year, with decreases of \$153,501 and \$333,543 in landed and marketed values, respectively. The decreases were greatest in Nova Scotia and the Magdalen Islands, the New Brunswick catch being up more than 2,000,000 pounds. There were much smaller landings in eastern Nova Scotia and Cape Breton island. Landings of the Caraquet and Lunenburg salt fishing fleets were less than in 1934.

## THE HADDOCK FISHERY

Almost the entire catch of haddock is taken in Nova Scotia waters. This fishery is most important for the fresh fish trade. The total catch in 1935 was 36,526,900 pounds with a landed value of \$570,083, as compared with 35,239,100 pounds valued at \$508,184 in 1934. The marketed value of \$1,124,420 represents an increase of \$55,611 over the previous year.

Heavier landings were made at Halifax and in southwestern Nova Scotia for the fresh fish trade. At North Sydney, where there was a new buying plant, and at Ingonish and Petit de Grat there were substantial increases in the catch. At the two latter points most of the spring catch was taken by trap-nets. A new departure was the shipping of both spring and fall haddock by smack from Petit de Grat to Boston with satisfactory results.

## THE SARDINE FISHERY

Sardines are taken only along the coast of Saint John and Charlotte counties, New Brunswick, where this fishery is more important than any other. While the catch was less than in 1934 by 731,200 pounds, the returns to the fishermen were somewhat greater, and the marketed value increased \$297,090 to \$1,335,279 which is a record since 1929.

The canneries put up 338,436 cases of sardines, as compared with 288,091 cases in 1934 and 180,597 in 1933.

## THE HERRING FISHERY

Increases in the catch of herring occurred in every part of the division except Prince Edward Island, where the spring fishery, almost a total failure, yielded the smallest catch in many years. The bulk of the herring catch of the division is taken on the two coasts of New Brunswick. There the year's catch increased by over 2,311,300 pounds, due mostly to a heavy run of spring herring on the east coast. The Nova Scotia catch was about 2,433,100 pounds greater on the mainland than in the year before but landings fell off in Cape Breton as the summer herring did not appear in Gabarus bay.

Aggregate landings for the division were 85,250,900 pounds with landed value of \$392,798 and marketed value of \$960,994. In the previous year 80,757,200 pounds, with landed value of \$337,007, were taken.

## THE MACKEREL FISHERY

There was a further decline in the mackerel catch, 15,890,300 pounds being landed as compared with 18,976,000 pounds in 1934 and 26,234,000 pounds during the preceding year. The Nova Scotia catch fell off 3,296,200 pounds and there was also a slight decrease in Prince Edward Island. In the Magdalen Islands, one of the heaviest producing areas, the catch was greater by 626,800 pounds.

Landed value totalled \$184,283 and marketed value \$304,560, compared with \$217,032 and \$417,600 respectively in 1934.

The range of prices for salt mackerel was considerably lower than in the previous year.

## THE SMELT FISHERY

Out of a total smelt catch of 6,942,400 pounds, the east coast of New Brunswick produced 5,273,900 pounds and accounted for most of the increase of 1,715,100 pounds in the divisional aggregate. There was a slight decrease in Nova Scotia but the Magdalen Islands' catch dropped more than 50 per cent.

The quality of smelts as taken from the water was very good, the fish being mostly of sizes suitable to the trade. This was particularly noticeable in eastern New Brunswick, which is the heaviest producing area. The prices offered, however, were discouraging, the fishermen receiving as low as three and four cents per pound for prime smelts, including a large proportion of extras. This, coupled with unsuitable freezing weather at the opening of the season, reduced the value of the catch, the landed value being \$341,828 and the marketed value \$538,707, compared with respective values of \$376,543 and \$505,825 for the smaller catch of 1934.

## THE SALMON FISHERY

The commercial catch of salmon for the division for the past 5-year period has been as follows:—

1935.....	2,216,900 lbs.
1934.....	2,538,900 "
1933.....	3,180,000 "
1932.....	2,783,600 "
1931.....	3,923,000 "



Decrease in 1935 was most noticeable on the east coast of New Brunswick where the catch declined 345,900 pounds. On the Bay of Fundy shore of that province, however, there was an increase of about 25 per cent. In Nova Scotia the catch was greater by about 35,000 pounds on the mainland but fell off in Cape Breton island by about the same amount.

The total marketed value of salmon taken in the division in 1935 was \$324,533 compared with \$397,053 in 1934.

#### THE HALIBUT FISHERY

The Atlantic coast halibut fishery is pretty well confined to Nova Scotia areas. The total catch in 1935 was 2,917,000 pounds or an increase of 456,400 pounds over the preceding year's figures. Marketed value was 339,372 as compared with \$295,632. Southwestern Nova Scotia accounted for the bulk of the catch and almost the entire increase, halibut landings being made mostly at Lunenburg, Lockeport, Shelburne and Yarmouth.

#### THE SCALLOP FISHERY

Scallops are only produced in commercial quantities in Digby and Lunenburg counties, Nova Scotia, and Charlotte county, New Brunswick. The extra-territorial fishery off Digby county is by far the greatest, and of the 1935 total catch of 133,106 gallons (shelled) Digby produced 76,611 gallons; the remainder of the catch was taken in Lunenburg county, 49,761 gallons, and Charlotte county, 6,734 gallons.

The landed and marketed values for the division were \$206,724 and \$207,436, respectively, as compared with \$166,699 and \$168,325 in 1934. The Digby fishery has been rapidly developed in recent years and is increasing annually in value. A new scallop bed discovered by the fishery vessel *Arleux* 12 miles north of point Prim produced a large catch in 1935.

#### THE SWORDFISH FISHERY

The total catch of swordfish is taken on the Atlantic coast of Nova Scotia, the chief fishery being on the east coast of Cape Breton island from Louisburg to Ingonish. The catch of 1935 was the greatest since the inception of the fishery 2,233,900 pounds being taken with a marketed value of \$264,097. In 1934 the catch was 1,409,100 pounds and was marketed at \$176,640. Swordfish find a ready market in the New England States and are transported there by carrying smack and express after being properly dressed and packed in ice in boxes.

#### THE OYSTER FISHERY

Oyster catch for the year was 4,752,000 pounds or approximately 23,760 barrels, compared with 21,667 barrels in 1934. While New Brunswick and Prince Edward Island produced by far the bulk of the catch, the increase of 2,141 barrels, however, was made in Nova Scotia, chiefly in the catch for Cape Breton island.

Prince Edward Island was again the heaviest producer, with a catch of 10,014 barrels or about the same as in 1934. Marketing conditions were fairly satisfactory but affected to some extent by ungraded oysters being forwarded by some shippers. There appears to be a growing demand for inspection for grade and quality, and experienced shippers are finding it more profitable to grade their oysters carefully and return the culls to the beds to be reconditioned.

Oysters are inspected by the department's officers for size and in order to see that containers are up to the required standard. There has been a vast improvement in these respects in the past few years.

## OTHER FISHERIES

The year's production of hake and cusk was less by 5,655,200 pounds than in 1934 and the landings of pollock also fell off. Markets for these fish were not favourable and the low price offered hardly covered operating costs. This condition was keenly felt along the Digby Neck shore and in Charlotte county, where these species are largely produced.

Much greater quantities of clams were taken than in the year before, both for export in the fresh state and for canning. The catch in Charlotte county almost doubled. The canneries enjoyed a successful season. In the Digby-Yarmouth area large quantities of clams in the fresh state were exported.

## NOVA SCOTIA

While there was a decrease of 2,645,600 pounds in the total production in Nova Scotia during 1935 as compared with the preceding year, values were maintained; in fact, the marketed value of all fish products was greater by over \$179,000.

The lobster fishery was again of chief importance and was prosecuted vigorously on all parts of the coast. The catch decreased by three-quarter of a million pounds but both landed and marketed values were greater than in 1934. In the southwestern district, where a 9-inch size limit has applied since 1932, the catch increased by 232,200 pounds but in the eastern and Cape Breton districts there were decreases of 612,300 pounds and 385,300 pounds, respectively. The production of lobsters in the province for the past six years has been as follows:

	Pounds
1935.....	17,683,600
1934.....	18,459,000
1933.....	17,685,800
1932.....	23,773,000
1931.....	22,364,900
1930.....	20,820,100

Of the twelve chief varieties of fish produced in the province increased landings are shown for 1935 for five, namely, haddock, herring, halibut, swordfish and scallops with corresponding increases in both landed and marketed values. It was a banner year for swordfish with a record catch and satisfactory prices.

The cod fishery suffered a most serious decline of over 8,228,000 pounds. The catch for the southwestern district was about the same as in 1934 but cod fishing was unsuccessful in the eastern district.

The pollock and hake fisheries, particularly in the Digby section, fell off sharply, but because of unsatisfactory marketing conditions mackerel catch and value were considerably less than in 1934, owing to small catches in the southwestern district and Cape Breton and low prices for salt mackerel.

The table given below shows the total catch and values and similar information for the chief varieties taken:—

1935

Total quantity of all fish landed, lbs.....	235,409,000
Landed value.....	\$ 4,762,116
Marketed value.....	\$ 7,852,899

	Lbs.	Landed Value	Marketed Value
		\$	\$
Lobsters.....	17,683,600	1,913,774	2,732,872
Cod.....	92,439,100	1,103,381	1,809,573
Haddock.....	35,634,200	553,051	1,104,618
Herring.....	21,900,900	147,334	351,998
Halibut.....	2,903,500	232,364	338,017
Swordfish.....	2,233,900	148,401	264,097
Mackerel.....	11,082,000	141,324	213,718
Scallops (shelled).....gals.	126,372	196,191	196,903
Hake and Cusk.....	11,523,300	51,267	162,585
Salmon.....	603,000	74,271	89,249
Smelts.....	618,600	37,722	58,334
Pollock.....	4,999,000	29,365	53,732

1934

Total quantity of all fish landed, lbs.....	238,003,300
Landed value.....	\$ 4,619,383
Marketed value.....	\$ 7,673,865

	Lbs.	Landed Value	Marketed Value
		\$	\$
Lobsters.....	18,459,000	1,821,419	2,487,633
Cod.....	100,667,300	1,231,667	2,068,566
Haddock.....	34,150,600	488,269	1,042,361
Herring.....	19,467,800	125,316	301,204
Halibut.....	2,425,400	213,562	292,695
Swordfish.....	1,409,100	117,617	176,640
Mackerel.....	14,373,200	173,301	330,805
Scallops (shelled).....gals.	73,136	136,030	137,656
Hake and Cusk.....	15,435,700	68,082	173,081
Salmon.....	604,800	70,192	87,973
Smelts.....	622,100	40,968	60,748
Pollock.....	6,188,900	34,025	71,339

## ANGLING GENERALLY

Water conditions generally during the 1935 season throughout the province were not ideal for good angling. Nevertheless, good catches of salmon and trout were made in many of the best waters inhabited by sport fish. The water held to a fair level during the first part of the season. From the early part of June until the latter part of August it became low and warm and, therefore, did not offer, during that period, the best of conditions for the successful ascent of salmon or trout or for good angling. Heavy freshets occurred in the eastern section in the latter part of August, and from that time on until the end of the season, conditions were much improved for angling for both trout and salmon and good catches were made.

*Angling in Cape Breton.*—Although the Cape Breton rivers were in good condition during the early part of June, very few fish ascended. After June 15 the water became low and clear so that practically no salmon entered the streams



until after the heavy freshet that occurred on August 23 and 24. During the last week in August and from that time until the end of the season on October 15 salmon ascended in large numbers and good fishing obtained.

It is gratifying to report in salmon taken by anglers on the Margaree, a substantial increase of 383 as compared with the 1934 season, the 1935 catch being 527 fish as compared with only 144 in the previous year and 470 in 1933. From the opening of the season until August 23 only 35 fish were landed. During the week ending August 31 78 were taken. From August 24 until the end of the season satisfactory catches of salmon were landed each week.

There were 53 salmon landed in Little river as compared with only 3 in the 1934 season and 116 in 1933. The best catches were made during the month of June.

The total number of salmon landed in the North river, Victoria county, was 252, compared with 95 for the preceding year, 76 in 1933 and 37 in 1932. During the past few years it has been noticed that salmon are ascending this river earlier than in years gone by and in larger numbers. Although the water was low during July and August there were plenty of salmon in the pools. In August 101 fish were landed, compared with 58 during the same month in the preceding year, and only 15 in August, 1933. The first fish taken was hooked on the opening day of the season. The largest fish landed weighed 35 pounds.

Two salmon were landed in Middle river, Victoria county. None were taken there in the preceding year and two in 1933.

There were 13 salmon landed in Grand river, Richmond county, compared with only 6 in 1934 and 19 in 1933. They weighed on an average about 10½ pounds.

The catch of trout in the Margaree river, Little river, and Pleasant bay was 2,279, as compared with 4,433 in 1934, a decrease of 2,154. The falling off was largely due to the fact that the tributaries of the northeast Margaree were closed to fishing, and to cold weather at the opening of the season which resulted in very little angling being carried on. The trout taken in the lower reaches of Little river were larger than in any of the other streams, weighing on an average from three to five pounds.

The usual large schools of trout did not appear in lake Ainslie, the catch being 1,007, taken by 335 fishermen, compared with 1,359, caught by 398 fishermen in 1934. The catch at river Denys was fairly good in the early spring, but poor during the summer months, owing to the water being low. Altogether 965 trout weighing 517 pounds were taken by 135 fishermen there.

At Indian river, Whycomagh, 79 fishermen caught 380 trout, weighing 125 pounds. Practically all these fish were taken near the outlet of the river.

From L'Ardoise to Framboise the best catches were landed during the weeks ending May 25 and June 23. During the latter week trout were very plentiful in Grand river, but would not take the hook.

From Louisburg to Glace bay trout fishing was largely confined to Catalone lake and the tributaries of the Mira river. Good angling prevailed in these waters during May and June, and fishing in Catalone lake showed much improvement over the preceding two seasons. A large number of trout weighing from two to five pounds were taken in the lake and also in the Mira river.

In the district from Washabuck river to Indian brook, St. Ann's, 2 339 pounds of trout were taken by 953 anglers. In the year before the landings by 1,178 anglers weighed 2,177 pounds. The largest catches were taken in North river, St. Ann's, where the heaviest fish landed weighed 5¼ pounds.

At Warren's brook, Ingonish, good trout catches were landed during the latter part of May and early in June. At Clyburn's brook Ingonish, trout fishing was satisfactory the first three weeks of August.

*Eastern Mainland.*—The water in the streams and lakes of the eastern mainland of the province held at a fair level until about the end of May but

from that date onward until the middle of August it was too low and warm to give good angling. Heavy rains fell in the latter part of August and in September, greatly improving angling for both trout and salmon, and good catches were made during this period. The principal salmon angling streams in the district are: Ingram river, Osier river, Nine Mile river, Musquodoboit river, Ship Harbour river, Tangier river, West river, Sheet Harbour, Salmon river, Port Dufferin, Moser river, Ecum Secum river, Liscomb river, St. Mary's river, and Country Harbour river.

In Guysboro west, the catches of salmon by angling in 1935 and the two preceding seasons have been as follows:—

	1935	1934	1933
Ecum Secum river.....	71	51	52
Liscomb river.....	51	6	14
St. Mary's river.....	241	64	124

Spawning conditions in all the rivers, including those tributary to Northumberland strait, were favourable and large runs are reported by the inspectors as having ascended the streams. No excessive freshets occurred, either at the time of the fall migration or afterwards, to destroy or injure the eggs.

Trout fishing was good until about the end of May and from the middle of August until the end of the season after the rains occurred.

*Western Mainland.*—The water became very low in the rivers of this district after June 15. In some cases the salmon could not ascend and in other cases where they were in the rivers they would not readily take the fly. However, fair catches were made on the best fishing rivers of the district. In Lunenburg county the following numbers of salmon and grilse were landed by rod:—

Gold river.....	20
East river.....	20
Middle river.....	125
LaHave river.....	150
Petite Riviere.....	110

The rivers of Queens county produced salmon and grilse as follows:—

Medway river.....	474
Mersey river.....	662

Thirty salmon were taken in the Clyde river, Shelburne county; 80 in the Tusket river, Yarmouth county, and 28 in the Salmon river, Digby county.

The catch in Annapolis county was:—

Lequille river.....	4
Round Hill river.....	20
Annapolis river.....	30
Nictaux river.....	13

Good trout fishing was enjoyed in many waters throughout the district both by resident and non-resident sportsmen.

#### FISHERIES PATROL SERVICE

The two patrol boats *Venning* and *Gilbert* were on duty at the beginning of the year in Nova Scotia, eastern district, and operated continuously from January to December. During that period they both were engaged in patrol work along the Atlantic coast in Nova Scotia, Districts Nos. 2 and 3, until late in April, proceeding then to the Northumberland straits.



The *Venning* proceeded to the Miramichi Bay area on May 21 and continued duty in that area until August 1. She was then engaged in patrol work in eastern Nova Scotia, particularly during open season in lobster fishing district No. 8 until October 15, when she proceeded to Prince Edward Island, continuing patrol work there until October 28. Returning to Nova Scotia, patrol work was carried out along the Atlantic coast of the eastern part of the province until December 31. The distance patrolled by the *Venning* was 9,765 miles.

The *Gilbert* proceeded from eastern Nova Scotia on May 16 to Dalhousie, N.B., to tow salmon pontoons for the Miramichi hatchery branch and returned to Nova Scotia district No. 2 on July 14. Patrol of this latter district was carried on until August 16 when the boat went to Prince Edward Island to patrol in the open lobster fishing district, returning on September 1. Duty as mother ship for the fishing fleet at Bickerton and Drumhead was performed from December 6 to January 15, 1936. During the year the *Gilbert* patrolled 7,286 miles.

The chartered boat *Marmat* was constantly engaged in patrol work in Northumberland straits from April 30 until October 31 and did effective work, patrolling 6,373 miles.

The *Dorothy M.*, an additional small chartered boat, was engaged in Cumberland county from August 20 to September 30, for the area immediately east of the lobster fishing boundary line and was effective in stopping attempts at illegal fishing. A total of 1,317 miles was covered by this boat.

The *Capelin* patrolled the waters of southwestern Nova Scotia from Pubnico to the head of the bay of Fundy throughout the year. This boat's work was particularly effective in preventing illegal lobster fishing and enforcing the size limit regulation. Her services were quite satisfactory and her activities were no doubt instrumental in keeping down illegal fishing. During the winter the *Capelin* acted as a mother ship to the haddock and lobster fishermen in the St. Mary's bay and adjoining districts in the bay of Fundy and performed duties in this regard during December with the Digby scallop fishing fleet. A total of 5,729 miles was covered in patrol duties.

The *Halkett* was recommissioned at Lunenburg on April 1 and was used throughout the remainder of the year for patrol work in connection with the enforcement of the fishery regulations in the counties of Lunenburg, Queens and Shelburne. The work of this boat was successful in suppressing illegal lobster and salmon fishing, as well as in securing the proper enforcement of the lobster size limit regulations.

#### FISHERY PROTECTION SERVICE

The C.G.S. *Arras* and C.G.S. *Arleux*, the former under the command of Captain Clement Barkhouse and the latter under the command of Captain H. P. Cousins, were actively engaged throughout the year in connection with the many duties requiring their attention in the division. The work performed by each vessel was extremely satisfactory.

The *Arras*, during the early months of the year, was on service along the coast of southwestern Nova Scotia where she was actively engaged in lobster protection, breaking ice to assist the work of the local fishing fleet, supervising the operations of foreign fishing vessels working near the three mile limit, rendering assistance to vessels and boats in distress, etc.

On January 1 the ship was at Shelburne assisting the fishing boats and vessels and worked in that vicinity practically throughout the month. On January 28 she proceeded west to keep the channel open at the port of Yarmouth. On February 9 supplies were taken to the lighthouse keeper at Green Island. From March 5 to the end of the month ice was broken at such ports as Riverport, LaHave, Chester, Shelburne, Bridgewater and other places where required in southwestern Nova Scotia for the convenience of the fishing fleet,



etc. From April 12 to May 23 the ship was laid up for annual overhaul at Liverpool and then proceeded on regular patrol, working eastward to Halifax to take on supplies and prepare for work on the Grand Banks and in the waters of Newfoundland as a hospital ship with the Grand Banks fleet. On June 6 the *Arras* proceeded to sea towards Burin, Newfoundland, to join the Lunenburg fishing fleet, cruising over Middle Ground banks, Missaine, and St. Pierre banks and arriving at Burin on June 13. The vessel remained with the fleet during the summer as a hospital ship until her return to Nova Scotian waters on September 3.

With regard to work performed on the banks Captain Barkhouse reports in brief as follows:—

During the season we had 25 Lunenburg bank trawlers and handline vessels working on the banks. We had 21 beam trawlers, four Italian beam trawlers, four Portuguese beam trawlers and four Spanish beam trawlers and two Newfoundland beam trawlers, all working along the western edge of banks, but these trawlers did not work on the middle of banks and did not bother our fishing vessels. The capelin bait was late coming in. The squid came in the last of July and we had plenty in the harbours, but none on the banks. The squid were of very good size and remained in the harbours until we left the banks for home. We had considerable sickness in the fleet. Three men were in hospital for major operations, and during the season the doctor gave medical treatment 599 times.

While the *Arras* was on the banks weather, bait and ice reports, etc., were broadcast twice daily from the ship to vessels of the fleet. During the year the vessel steamed 11,084 miles and was at sea 193 days.

From January 1 to 3 the *Arleux* was engaged, as in previous years, as a mother ship to the winter haddock fishing fleets at Canso, Petit de Grat, and vicinity. She was relieved from January 4 to 11 by C.G.S. *Lady Laurier* and proceeded to the Bras d'Or lakes to release vessels frozen in the ice. She also patrolled from Ingonish to North Sydney, assisting vessels in distress, then returned to Canso on January 12 and remained there with fishing fleet until boats laid up for the season. The ship arrived at Halifax on January 17 to resume regular patrol duties and ice breaking.

The *Arleux* was engaged from February 1 to 20 in patrolling the waters of the southwestern section of Nova Scotia and in breaking ice at Shelburne, LaHavre, Lunenburg, etc. From February 21 to April 2 the ship was laid up at Lunenburg for annual repairs and again resumed patrol work on April 3, proceeding towards Halifax, breaking ice in Bedford basin and Spanish bay and then going to Canso on regular patrol work. During May and June the *Arleux* patrolled the southwestern coast of Nova Scotia in connection with the enforcement of the lobster and salmon fishery regulations, and from July 5 to July 19 she patrolled the eastern coast and assisted at the lobster carnival at Pictou. During the latter part of July and the first week of August the waters of the bay of Fundy were patrolled and scallop investigation work carried on. Two beds were located between Lurcher shoal and West point, Brier island. The remainder of August and the month of September were spent by the vessel in patrolling Atlantic coast waters. During that time the ship was in the Cape Breton area assisting the swordfish men. During October and the first half of November, Northumberland strait and the eastern coastal waters were patrolled to prevent violation of the lobster fishery regulations, etc. From November 20 until the end of the year she served as a mother ship with the Canso and Petit de Grat winter haddock fishing fleets. The ship spent 203 days at sea and steamed 12,212 miles, while 390 miles were covered in the motor boat carried with her.

#### LUNENBURG SALT FISHING FLEET

The Lunenburg fleet of 28 vessels produced a catch of 83,400 quintals of salt codfish during the year, in addition to the catches taken in "fresh fishing." The frozen baiting and spring trips were not as successful as those of the

preceding year but an increased quantity of fish was taken on the summer trip. Owing to unsatisfactory markets the prices received were about \$1 per quintal less than those paid in 1934.

The following table shows the number of vessels engaged and the quantity landed each trip, as compared with the previous year:—

1935	Number of Vessels	Catch Quintals
Frozen Baiting.....	16	7,500
Spring.....	26	20,400
Summer.....	28	55,500
Fall.....		
		83,400
1934		
Frozen Baiting.....	17	13,250
Spring.....	26	28,300
Summer.....	31	50,050
Fall.....	1	400
		92,000

The highliner for the season was the *John H. McKay* with a catch of 4,250 quintals.

#### THE FRESH FISHING FLEET

An interesting feature in the Nova Scotia fishing industry during recent years has been the development of the large fresh-fishing vessel of the spike-sparred type equipped with high-powered diesel engines. This is a rugged craft, capable of operating under any weather conditions and landing fares with regularity when fish can be caught. Winter fishing in dories from such vessels is a hazardous occupation but they are ably manned by experienced skippers and efficient fishermen and have produced the bulk of the fresh fish obtained on the offshore grounds during the fall and winter seasons of the past few years.

Among the vessels of this kind operating out of Lockeport, Shelburne, Lunenburg, Liverpool and Halifax during the past year were the following: *Archie F. MacKenzie, Frances G. Roue, Marion & Emily, Julie Opp II, Lister, Bessemer, Irene Mary, Shirley B. Corkum, Isabel F. Spindler, Howard Donald, Cachalot, Dot & Hellie, Kristiane M., Douglas & Robert, Lucille M., Silver Arrow, Bruce & Winona, Mahaska, Andrava, R. B. Bennett, Jean & Shirley, Sir Ernest Petter, Muriel Isabel, Kasgra, Ronald George, Robert J. Knickle, Marguerite Tanner, E. F. Zwicker, Marjorie & Dorothy, Haligonian, and Marshall Frank.*

A number of these vessels have recently been equipped with radio telephones and can communicate with their owners from the fishing banks.

#### PROSECUTIONS AND CONFISCATIONS

During the year there were 98 prosecutions in Nova Scotia—7 in District No. 1, 60 in District No. 2, and 31 in District No. 3. The confiscations numbered 233, of which 25 were in District No. 1, 108 in District No. 2, and 100 in District No. 3.

#### NEW BRUNSWICK

New Brunswick's fisheries produced a total of 139,771,400 pounds of fish and shellfish during the year 1935, or 3,634,600 pounds more than in 1934. Landed value, however, was approximately the same in the two years but 1935 marketed value increased by \$269,645.

The outstanding feature of the year's operations was the substantial increase of \$297,090 in the marketed value of the sardine catch on the bay of Fundy coast principally in Charlotte county.



Of the twelve chief varieties taken in the commercial fisheries of the province seven show increased catches for 1935—herring, smelt, cod, clams, alewives, oysters and pollock. In the case of cod and smelts, however, the value return for the year decreased.

A further decline was shown in the lobster fishery on the east coast, due mainly to a reduced catch in southern Kent and Westmorland counties. The catch in the bay of Fundy showed considerable improvement over the preceding year's figures. While fewer sardines were landed than in 1934 there was a larger pack from the canneries and with higher values, conditions in the industry were more satisfactory. There was a large increase in the catch of herring on both coasts of the province, especially on the east coast where the spring run was one of the heaviest on record. The early fish, however, are of little value except for bait and fertilizer. The smelt fishery was satisfactory from the standpoint of quantity and quality but unsuitable freezing weather and low prices greatly reduced the value figures. Total marketed value was \$30,366 less than that of 1934, notwithstanding the greater catch. The salmon fishery of the bay of Fundy district improved about 25 per cent, as already noted, but in the inland district the catch was less, and on the east coast, which has the chief fishery, the landings declined 345,900 pounds. The east coast decrease was mainly in the drift-net fishery. A heavy increase in cod landings on the east coast was due to greater catches made in the Miscou and Shippegan Island area; drying conditions, however, were not suitable and smaller prices than usual were offered. The provincial production of clams was much greater than in 1934 and canning and export of clams in the fresh state from Charlotte county beds were carried on in a large way. The oyster catch on the east coast was slightly larger than in 1934. Scallop fishing was not successful and the catch fell off more than 50 per cent. Less hake and cusk were taken by over 2,000,000 pounds, but, on the other hand, the pollock catch increased by almost 1,000,000 pounds; markets for these fish were poor but a bonus of 20 cents a hundredweight was paid by the provincial government.

The commercial fisheries of the inland district produced slightly more than in 1934—740,200 pounds as compared with 644,400 pounds. The marketed value of the production, however, was only \$24,722, as compared with \$27,506. Salmon, shad, alewives and bass were the chief species taken.

The following table gives total catch and value figures for the province for 1935 and similar information covering results in each of the chief fisheries:—

1935

Total quantity of all fish landed.....	lbs.	139,771,400
Landed value.....	\$	1,882,451
Marketed value.....	\$	3,949,615

	Lbs.	Landed Value	Marketed Value
		\$	\$
Sardines.....	37,499,800	276,175	1,335,279
Lobsters.....	5,483,100	592,409	818,699
Herring.....	48,033,800	197,906	508,150
Smelts.....	5,273,900	266,296	429,840
Salmon.....	1,656,200	186,572	243,554
Cod.....	14,984,800	133,066	197,714
Clams and quahaugs.....	6,113,000	31,948	73,559
Alewives.....	4,896,900	28,920	64,894
Oysters.....	1,674,200	33,612	47,294
Shad.....	1,087,600	35,090	42,357
Hake and cusk.....	5,565,500	21,779	41,927
Pollock.....	3,205,800	19,045	29,013
Scallops (shelled).....	6,734	10,533	10,533



## DEPARTMENT OF FISHERIES

1934

Total quantity of all fish landed.....	lbs.	135,738,900
Landed value.....	\$	1,915,657
Marketed value.....	\$	3,679,970

	Lbs.	Landed Value	Marketed Value
		\$	\$
Sardines.....	38,231,000	267,797	1,038,189
Lobsters.....	6,507,300	587,658	812,045
Herring.....	45,722,500	165,408	463,512
Smelts.....	3,686,800	298,744	399,474
Salmon.....	1,922,100	213,820	261,744
Cod.....	12,951,400	136,119	222,171
Clams and quahaugs.....	3,725,600	18,626	49,240
Alewives.....	4,800,300	17,816	51,327
Oysters.....	1,654,600	34,143	44,870
Shad.....	1,174,300	39,042	49,687
Hake and cusk.....	7,637,400	29,316	66,442
Pollock.....	2,314,800	18,804	23,685
Scallops (shelled).....	gals. 16,718	30,669	30,669

## ANGLING

In the bay of Fundy section of New Brunswick fair catches of trout were made by anglers in Hoppey's lake, Irish river and Wood lake early in the season. Good fishing was enjoyed in Garnett stream, especially during April and May, and there was fair fishing obtained in Ball's lake, Grassy lake and the upper portion of the Musquash river. Good catches of trout were made in lake Utopia. Trout fishing is the main attraction for sport fishermen in the bay of Fundy section of the province.

In the eastern section about 500 non-resident and 1,000 resident anglers engaged in the sport fishery for salmon and trout. Approximately 55,000 pounds of salmon and grilse and 9,000 pounds of trout were taken. The main salmon angling rivers are the Restigouche and its tributaries, Jacquet river, Tetagouche and Nepisiquit in Gloucester county and the Tabusintac in Northumberland county. The chief trout rivers are the branches of the Restigouche and the Benjamin, Tetagouche, Pokemouche, Bartibogue, Tabusintac, Black, Kouchibouguac, Richibucto, Buctouche, Cocagne and Shediac.

Angling generally was not as good as during 1934, this owing to low water and extreme hot weather during the midsummer months. A calamitous fire in lower Gloucester county swept the upper waters of the Little Tracadie river.

Some heavy rains in the fall of the year greatly improved spawning conditions and large numbers of salmon made their way to the headwaters. This was particularly noticeable in the Miramichi area.

In the inland section 92,500 pounds of fish were taken by angling as compared with 80,500 pounds in 1934. The increase is accounted for by the improvement in the sport fisheries on the Miramichi river, particularly the early salmon fishing previous to May 24.

Angling on the Miramichi system showed a very marked improvement over previous years; in fact, angling on these streams was the best known for at least the past 10 years. The case was otherwise, however, with the St. John river, where fishing fell below the average. It is felt that the June freshet had a great deal to do with helping the Miramichi sport fisheries. During the remainder of the season the water became very low and warm, and it was not until late in the season that the St. John river angling picked up any. Information obtained from the guides and camp owners was that there appeared to be plenty of fish but they would not take a fly.

Hartt's Island pool, St. John river, fell off in angling excellence in the early part of the season, owing in part to the pool being changed by the ice going out in the spring. The pools at Bristol, Hartland and Bath offered good sport. Angling for landlocked salmon and trout in Skiff lake and Grand lake of the Chiputneticook Lake system was better than in previous years. Some large fish were taken from these waters, particularly landlocked salmon, one weighing as much as six pounds.

#### FISHERY PATROL SERVICE

Patrol service along the Bay of Fundy coast of New Brunswick was performed by the department's patrol boats *Thresher* and *Gannet Rock*. The *Thresher* was operated from Welchpool and did general patrol service throughout the district. The boat was handicapped, however, by the unsatisfactory state of the engine, which is being replaced by a diesel engine.

The *Gannet Rock*, with her base at Seal Cove, Grand Manan, was instrumental in preventing illegal lobster fishing, particularly in Grand Manan waters, and in enforcing the lobster size limit.

In addition to fishery patrol duties, both of these boats, when called upon to do so, convey sick persons from both Grand Manan and Campobello to St. Stephen for treatment.

In the eastern section of the province the usual patrol boat service was maintained. Five chartered boats were employed for the following periods: *Gulf Rover*, May 8-November 23, *Gulf Ranger*, June 3-November 26, *T. L. Mac*, June 3-November 16, *Bennett*, April 30-November 21, and *Miss 1931*, July 13-November 20. They carried on protection work in connection with the lobster, salmon, smelt and oyster fisheries. In addition, the following department-owned boats were used: The *Venning* from May 22 to July 31 in Miramichi bay to assist in the salmon drift-net fishery and the *Gilbert* from May 19 to July 12 in bay Chaleur, from Dalhousie to Bathurst, to check on salmon trap-nets during the weekly closed time and during the week to tow pontoons to the salmon retaining pond at New Mills.

All these boats did excellent service during most trying times and the efficiency of the service was in no small measure responsible for the successful curbing of illegal fishing during the past season.

Two of these boats, the *Gulf Rover* and the *Bennett*, were also employed for considerable time outside of the district, the former in District No. 2, Nova Scotia, and the latter in Prince Edward Island waters.

#### PROSECUTIONS AND CONFISCATIONS

During the year there were 121 prosecutions—17 in District No. 1, 78 in District No. 2, and 26 in District No. 3. All told, there were 397 confiscations. Of these 36 occurred in District No. 1, 271 in District No. 2, and 90 in District No. 3.

#### PRINCE EDWARD ISLAND

The total catch of all varieties taken in Prince Edward Island during 1935 was 20,891,800 pounds with landed and marketed values of \$640,764 and \$899,685 respectively. This represents a decrease both in catch and value compared to the preceding year, for which reduced catches of herring and lobster are mostly responsible.

Lobster fishing was greatly delayed by ice and unfavourable weather in May and there was a serious shortage of bait when the herring fishery during that month was practically a failure. The catch of lobsters declined by 1,270,600 pounds or between fifteen and twenty per cent, the fall fishery

in southern Prince county being particularly poor. The average size of lobsters taken during the spring season was much smaller than the average of a few years ago. The decrease in cod may be attributed to the failure of the June catch; the cod demand throughout the season, however, was good, at prices about the same as in 1934. Smelts were more plentiful and the catch was graded to meet the market requirements. There was an increase of 177,000 pounds in this fishery. While there was a slight decrease in oysters the value was somewhat greater. Oyster development in this district is receiving careful attention and the district supervisor comments as follows:—

“East and West rivers and tributaries, Vernon, Seal and Orwell rivers are all well stocked with small oysters, and no doubt the usual catch will be taken from these rivers during the coming season. Some of the leased areas are now producing a good quality oyster and a considerable increase in the production of these areas is anticipated during the season 1936. During the past year applications have been received and approved for the leasing of areas in Grand river, Rustico bay, Savage harbour, North lake and Fortune river. It would appear that within the next few years there will be considerable oyster development in all the rivers on the north shore between Kildare and cape Bear.”

The following table shows the total catch and value for the province with similar information for the chief commercial varieties:—

## 1935

Total quantity of all fish landed.....	lbs.	20,891,800
Landed value.....	\$	640,764
Marketed value.....	\$	899,685

	Lbs.	Landed	Marketed
		\$	\$
Lobsters.....	6,387,600	467,804	605,107
Cod.....	4,545,100	39,276	85,269
Oysters.....	2,002,800	46,973	60,246
Smelts.....	1,001,500	35,055	49,560
Herring.....	3,152,500	23,111	44,502
Mackerel.....	804,100	11,462	20,290
Hake and cusk.....	1,873,900	7,831	16,657
Clams.....	347,200	1,508	5,318
Quahaugs.....	1,900	935	3,723

## 1934

Total quantity of all fish landed.....	lbs.	23,326,200
Landed value.....	\$	695,114
Marketed value.....	\$	963,926

	Lbs.	Landed	Marketed
		\$	\$
Lobsters.....	7,658,200	536,012	674,186
Cod.....	4,642,300	38,024	84,445
Oysters.....	2,032,000	36,852	60,061
Smelts.....	823,800	31,659	40,360
Herring.....	4,852,500	24,885	53,872
Mackerel.....	896,300	13,931	19,590
Hake and cusk.....	1,544,800	6,704	17,817
*Clams and quahaugs.....	516,200	2,552	6,967

\*Clams and quahaugs shown separately in 1935.

## ANGLING

In the Dunk river, Prince county, trout were reported fairly plentiful but ran small. In Beaton stream good catches of sea trout were made during the season. There was no scarcity of water in these rivers as the tide flows in and out every day, but when there was extremely dry, hot weather in July and



August, trout did not ascend the streams and as a result angling was not very satisfactory during this period. Spawning conditions were much the same as usual.

The principal angling streams in Queens county are: head of East river, Bonshaw, Winter, Wheatley, Millvale and Hope rivers. Fairly good catches of trout were taken from them in 1935, especially during the early summer. In the hot period in July and August, angling, of course, was poor. There was no scarcity of water in any of these streams and spawning conditions did not differ from other years.

In King's county good fishing was enjoyed in the following waters—Fortune, Big pond, East lake, South lake, North lake and Naufrage. Trout were plentiful in these streams, especially during early summer. No complaints were made of water scarcity, but during the hot weather in July and August the trout appeared to have descended the rivers and angling, as a consequence, was poor. Spawning conditions showed little change.

#### FISHERY PATROL SERVICE

Ten patrol boats were engaged during the season to prevent illegal lobster fishing in Prince Edward Island areas and were allocated as follows: Three in west Prince county, two in east Prince county, four in Queens county, and one in Kings county. In addition assistance was rendered by the *Gilbert*, *Venning* and *Bennett* during the fall lobster fishing season. The service given was most satisfactory and illegal lobster fishing was kept to a minimum. A considerable amount of gear used in illegal operations was seized, consisting of rope, traps, anchors, etc.

#### PROSECUTIONS AND CONFISCATIONS

There were 43 prosecutions in the course of the year, 41 in Prince Edward Island and 2 in the Magdalen Islands. Eighty-six confiscations were made in Prince Edward Island and 3 in the Magdalens.

#### MAGDALEN ISLANDS

The total production of the Magdalen Islands' fisheries during 1935 was 23,302,400 pounds as compared with 25,305,900 pounds in 1934. There were corresponding decreases in the landed and marketed values of \$66,906 and \$138,749 respectively. Smaller catches of lobsters and codfish are largely responsible for the decreases, but the catches of herring and mackerel increased considerably. The decrease in cod may be attributed to unfavourable weather conditions.

The following table shows the total catch and values for the islands for the past two years and gives similar information regarding catch production of each of the chief varieties in each year:—

1935

Total quantity of all fish landed.....	lbs.	23,302,400
Landed value.....	\$	286,968
Marketed value.....	\$	379,790

	Lbs.	Landed	Marketed
		\$	\$
Lobsters.....	2,170,700	174,323	193,765
Cod.....	5,255,800	58,492	69,590
Herring.....	12,163,700	24,447	56,344
Mackerel.....	3,404,800	24,061	55,142
Smelts.....	48,400	2,755	973
Clams.....	254,000	1,270	1,270
Halibut.....	5,000	250	250

1934

Total quantity of all fish landed.....	lbs.	25,305,900
Landed value.....	\$	353,874
Marketed value.....	\$	468,804

	Lbs.	Landed	Marketed
		\$	\$
Lobsters.....	3,034,300	220,760	240,640
Cod.....	8,183,600	81,906	120,507
Herring.....	10,714,400	21,428	44,533
Mackerel.....	2,778,000	19,477	50,543
Smelts.....	94,600	5,172	5,243
Clams.....	415,000	2,075	2,075
Halibut.....	20,000	1,000	1,400

## THE DIVISION GENERALLY

## LOBSTER CANNERIES, INSPECTION AND GRADING

During the lobster fishing seasons of 1935, licences to can lobsters were issued for 271 canneries within the division. Of this number, 267 canneries actually packed lobsters. This figure is to be compared with 293 canneries operated during 1934, 289 during 1933 and 311 during 1932.

Comparative figures show the following distribution of canneries operated, by provinces:—

Nova Scotia.....	78	in 1935 as against	87	in 1934.
New Brunswick.....	84	"	96	"
Prince Edward Island.....	89	"	94	"
Magdalen Islands.....	16	"	16	"

It will be seen that last year there was a total decrease of 26 canneries.

During the canning seasons, regular inspections of all lobster canneries, as required under the Meat and Canned Foods Act, were carried out. The matter of checking weights of drained meat contents of the various packs was closely followed. Evidence that greater care was being taken by canners to produce correct weights is present in the fact that during 1934, inspection reports indicated 34 instances where underweights existed or were suspected, while during 1935 only 29 instances of supposed underweights were found. Final tests of the suspected packs in 1934 revealed 19 instances of actual underweight pack, while during the past year 16 instances were established. All underweight pack found was marked "underweight" as required under the Meat and Canned Foods Act.

The grading of all canneries was carried on in the usual way by the fisheries' inspectors, and all canneries received sufficient marks to enable them to obtain permits to operate. The average marks, however, received by canneries during 1935 showed a material increase over the average for the previous year. This was due to a general readiness on the part of owners to equip their canneries to a higher standard. Canneries operated without retorts during 1935 numbered only 59 as against 82 in 1934, 93 in 1933, and 120 in 1932. The percentage of canneries without retorts as against all canneries operated was 22·5 per cent in 1935, while percentages for the three previous years were 28 in 1934, 32·2 per cent in 1933, and 38·6 per cent in 1932.

## INSPECTION OF PICKLED FISH AND CONTAINERS AND FISH CURING ESTABLISHMENTS

The compulsory inspection of pickled fish which was made effective under the Fish Inspection Act on June 1, 1933, was continued throughout the past year, with fairly satisfactory results. This inspection has definitely improved the quality of containers as well as the quality of pickled fish during the past few years and has been of marked benefit in connection with the marketing of oysters for which the act provides standard containers.

The results of the year's work as compared with the two previous years is shown in the following table:—

	1935	1934	1933
Educational visits.. . . . .	1,991	1,708	2,034
Inspection of fish premises.. . . . .	2,416	2,926	2,442
Inspection of empty containers.. . . . .	78,512	63,655	72,111
Inspection of pickled alewives.. . . . .	8,326	6,950*	7,579*
Inspection of pickled herring.. . . . .	16,781*	18,928*	19,512*
	14,020†		
	34‡		
	4,618‡		
Inspection of pickled mackerel.. . . . .	40,384*	43,600*	59,128*
	245†		
	44‡		
Inspection of smoked herring.. . . . .	376,185	238,681	217,739
	18-lb. boxes	18-lb. boxes	18-lb. boxes
Inspection of oysters.. . . . .	17,763*	6,153*	9,665*
	3,022**	1,436**	1,460**

\* Bbls. † Half-bbls. ‡ Quarter-bbls. § Pails. \*\* Boxes.

The inspecting officers who carry out inspection under the Fish Inspection Act are required to qualify at a course of instruction before they undertake these duties and of the 63 inspectors employed in this division 56 are qualified to undertake inspection work not only under that act but under the Meat and Canned Foods Act as well.

#### ILLEGAL FISHING

During the year it was found necessary to take action in 262 cases for violations of the Fisheries Act. The number of prosecutions in 1934 was 427. Patrol forces both on land and sea were concentrated in areas where determined attempts were made to fish lobsters during close seasons. On the whole, the regulations were well observed, but the usual difficulty was experienced with lobster poaching in certain parts of the Gulf area. Unemployment and the attractive prices offered for canned and fresh lobsters naturally tended to make poaching more likely than it would otherwise have been. The area adjacent to the "late season" district on the northern side was the most troublesome in this respect, and in order to keep the situation under control it was necessary to seize a number of motor boats found fishing in closed waters and also some motor cars which were being used in carrying lobsters from the closed to the open district. It is satisfactory to be able to report that illegal lobster packing was entirely stamped out in one area where it had been going on for years.

The enforcement of the salmon fishing regulations in the Miramichi district was carried out in a most satisfactory manner, both on the tidal and non-tidal portions of the river.

Close co-operation has been developed with provincial game officers, registered guides, fish and game organizations and is proving most helpful in keeping illegal fishing at a minimum. In all parts of the division the Royal Canadian Mounted Police co-operates in the most energetic way with the fishery officials and during the year the force assisted the inspectors in dealing with numerous violations of the fishery regulations.

#### LOSS OF GEAR

It is estimated that the fishermen of the division suffered a loss in gear of approximately \$130,000 during the year. The loss was mostly in severe damage done to lobster fishing gear in southwestern Nova Scotia during the winter fishing season.

#### LOSS OF LIFE

Twenty-three fishermen lost their lives in following their hazardous occupation during the year. Of these ten were from New Brunswick, nine of them cod fishermen of Gloucester county. Five of these fishermen were lost with



their vessel while on the fishing banks. The circumstances in connection with the loss of the other four cod fishermen are particularly sad as they were drowned at Lower Caraquet, their home port, while coming ashore from their vessel at the end of the fishing season.

Nine fishermen were lost in Nova Scotia, one in Prince Edward Island, and two in the Magdalen Islands.

Two patrol boat guardians employed by the department were drowned while on duty, one at Mace bay, Charlotte county, N.B., and the other at Georgetown, Prince Edward Island.

#### REDUCTION OF FISH WASTE AND COARSE FISH

There were 18 reduction plants in operation during the year, 14 in Nova Scotia and 4 in New Brunswick. They produced, all told, 5,406 tons of fish meal, valued at \$255,248, and 106,895 gallons of fish oil of different kinds, valued at \$44,565, which was somewhat more than the quantity produced by the same plants during 1934.

#### FISHERIES ORGANIZATIONS

During the year the department's officers were in close contact with the various organizations representing fishermen, packers and anglers. The United Maritime Fishermen had a successful and active year. This organization, formed in 1930, is taking an important part in the fishing industry and many of the local federations operate their own lobster canneries and fish-curing establishments. These plants packed about 12 per cent of the entire lobster pack of the division in 1935 and marketed considerable quantities of pickle-cured codfish, salt mackerel and fresh salmon. The annual convention of the United Maritime Fishermen was held at Sydney during October and was largely attended by delegates representing the local federations.

The fish and game protective Associations of the three provinces were most active during the year, and co-operated splendidly with the department's officials in efforts to improve conditions with respect to sport fishing in the inland waters. When possible the supervisors and inspectors attended meetings of the local associations and at the annual meetings of the provincial associations numerous matters pertaining to sport fishing were dealt with by the supervisors concerned.

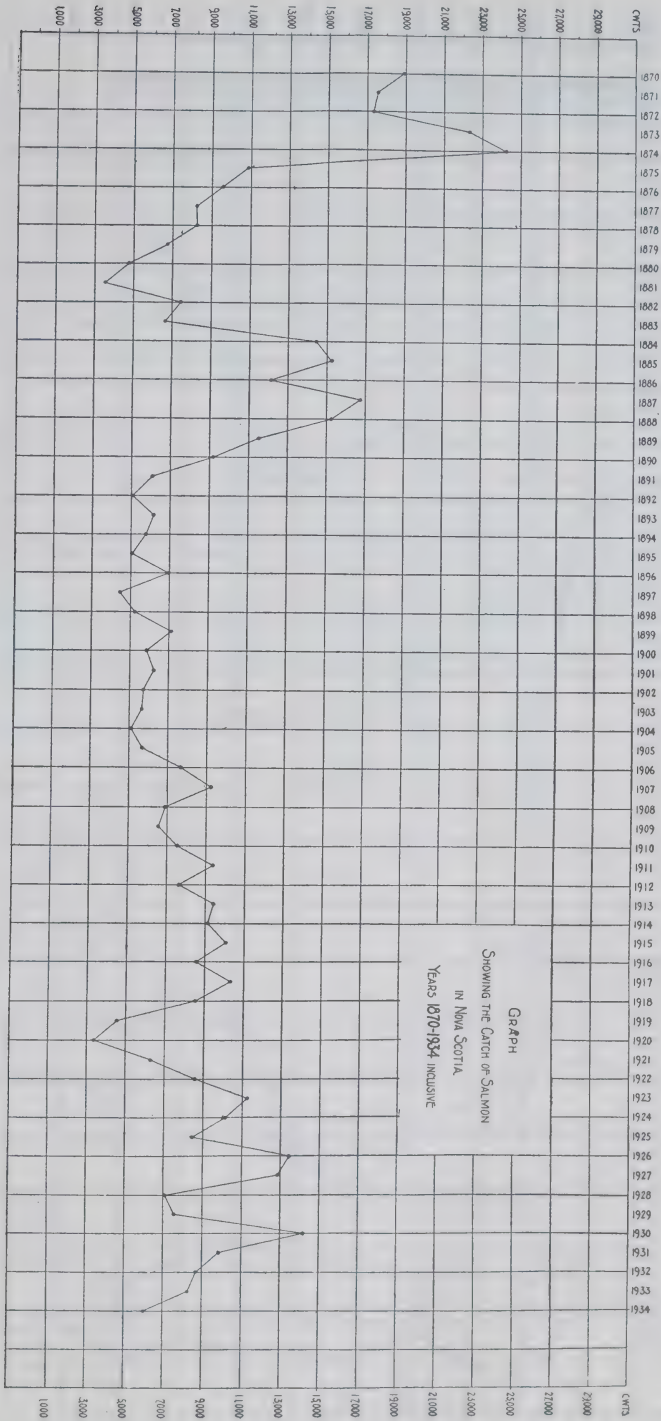
#### STAFF

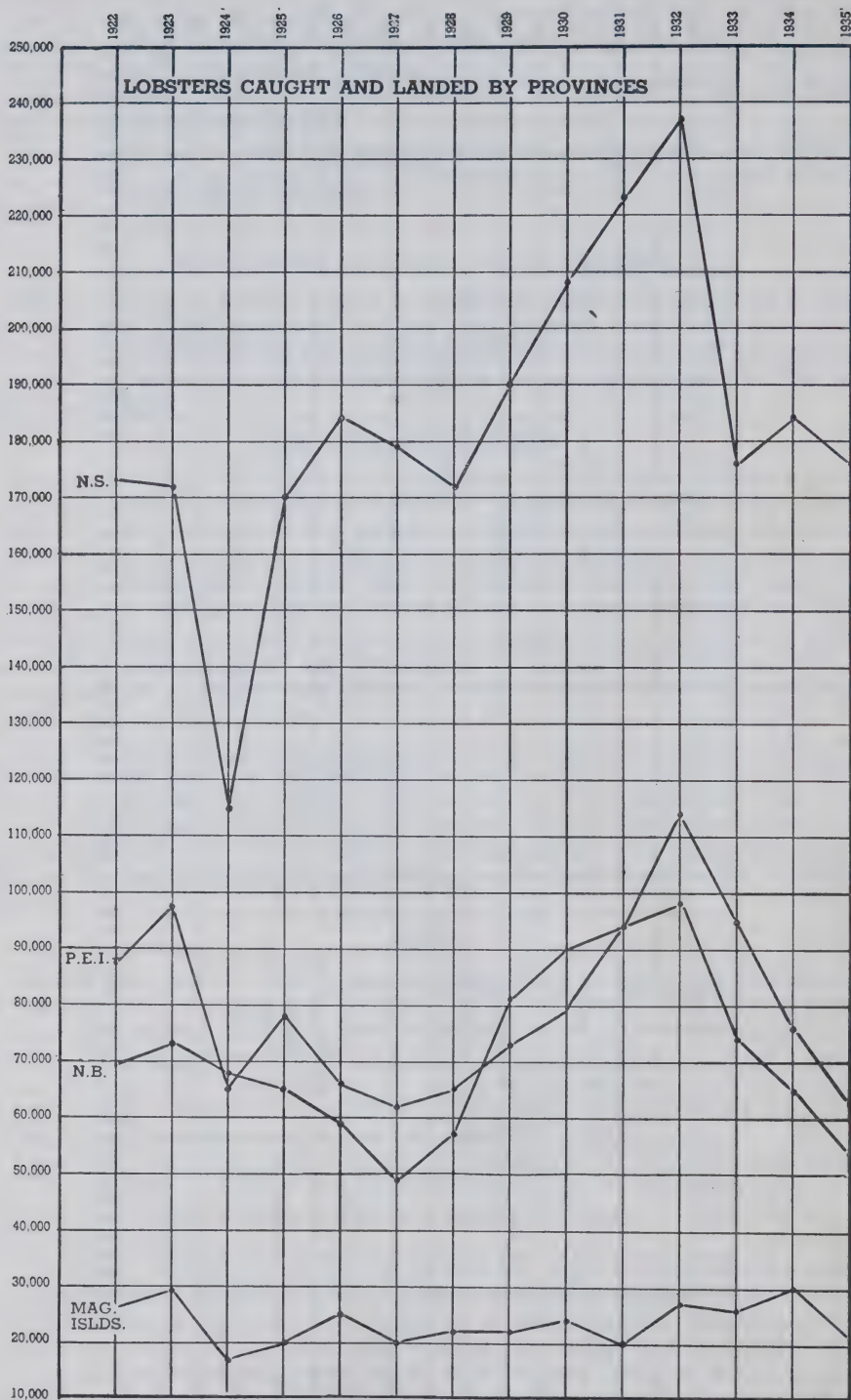
During the year E. G. Beaver, of Hartling, was appointed Inspector of Fisheries for the eastern part of Halifax county, a new sub-district being created by dividing that part of the county. Miss M. F. Harris, Clerk Grade 11 in the office of the supervisor for District No. 2, Nova Scotia, was obliged to retire at the end of the year due to ill health. She was replaced by Miss F. A. Ingram. G. L. Manning, of Chester, was appointed Inspector of Fisheries for Lunenburg east, replacing Inspector A. J. Evans who retired in 1934.

Inspectors Jardine, Losier, MacLeod, Adamson, B. Hunter and Beaver attended a qualifying course of instruction for Grade 11 Inspectors held at the Fisheries Experimental Station, Halifax, during February. All passed the required examinations.

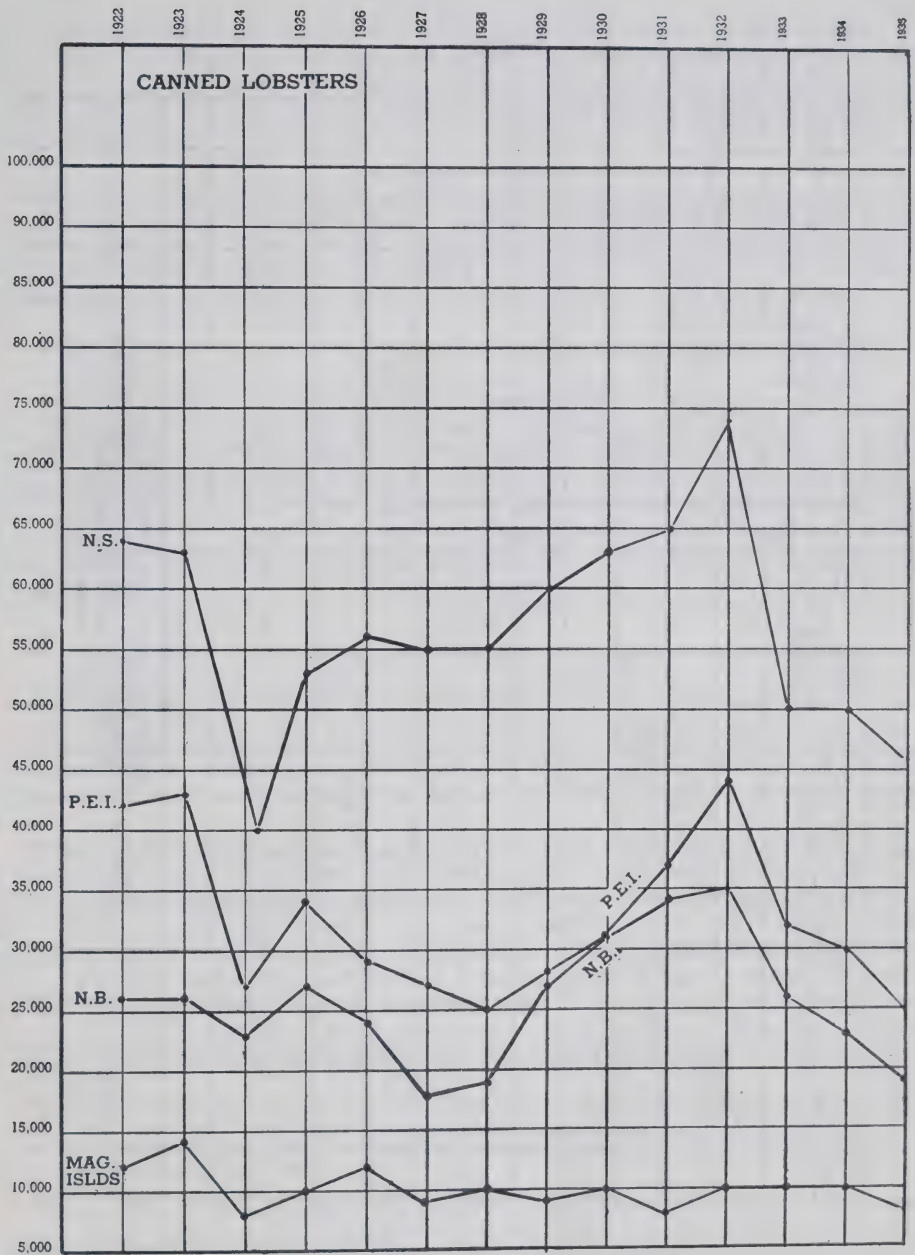
The usual conferences of fishery inspectors and hatchery superintendents were held by the supervisors in each district during the winter months. James Catt, District Supervisor of Fish Culture, attended these meetings and gave valuable instruction to the officers in matters pertaining to fish cultural work.

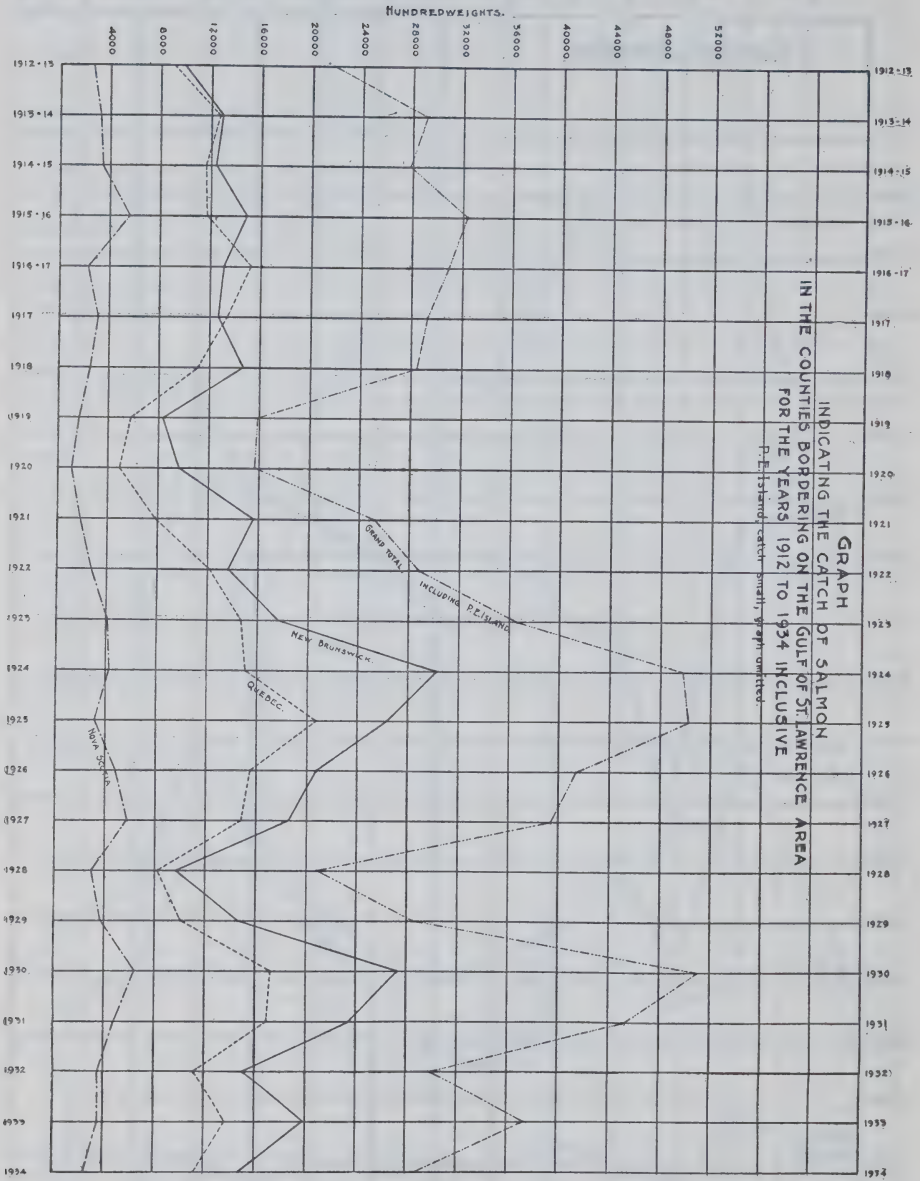
A conference of district supervisors was held at Halifax, January 23-26, 1936, for the purpose of considering proposed changes in the regulations and arranging a program of general work for the year.











# ANNUAL REPORT OF CHIEF SUPERVISOR OF FISHERIES MAJOR J. A. MOTHERWELL, WESTERN DIVISION (BRITISH COLUMBIA) FOR 1935

Generally speaking, from the standpoint of the quantity of fish caught, and the prices prevailing to the fishermen, 1935 has been a reasonably satisfactory year, although the prices to processors of the raw product, for instance, the salmon canners, had not been restored to the level which may be regarded as normally profitable.

## CANNED SALMON

The total provincial pack of all varieties of salmon was 1,529,022 cases, which is practically equal to the pack of the preceding year and was greater than the average pack during the last five years, as shown by the following statement:—

	Cases
1921-1925.....	1,340,735
1926-1930.....	1,816,763
1931-1935.....	1,228,631

*Sockeye*.—Practically all of the catch of sockeye salmon is canned and the pack for the year amounted to 350,444 cases, or 37,994 cases in excess of the average pack during the past five years and 35,097 cases greater than the average for the last fifteen years. This satisfactory showing was made notwithstanding that the catch at Skeena river was considerably less than anticipated. The average sockeye pack for the past 15 years, in 5 year periods, is shown as follows:—

	Cases
1921-1925.....	312,083
1926-1930.....	321,510
1931-1935.....	312,450

*Naas River Area*.—The pack from the sockeye run proceeding to the Naas river was 12,712 cases, compared with 36,242 cases in the previous year, 16,929 cases in the 4-year cycle brood year, and 26,500 cases in the 5-year cycle brood year.

The run to the Naas area is always impossible to forecast with any degree of accuracy, since the salmon undoubtedly run the gauntlet of the numerous traps and seines operating in Alaskan waters before they reach the Canadian side. The intensity of fishing in the waters to the north of the international boundary, and the position of the run in relation to the closed seasons provided by the Alaskan authorities, is likewise a considerable factor in the quantity of salmon reaching the Naas River district.

Deferring the opening fishing date from June 20 to July 1 may be expected to affect the Naas area particularly, as the farther north the runs the earlier they arrive.

Judging from the reports received from the Indians along the river, and from the officers who inspected the spawning grounds, the small catch cannot be attributed to a depleted run.

*Skeena River Area*.—Again the total sockeye pack in the Skeena area was disappointing, although undoubtedly there was quite a satisfactory escapement of parent fish to the spawning grounds. The pack of 52,879 cases compares with a total of 54,558 cases in the preceding year, 93,029 cases in the 4-year cycle brood year, and 130,952 cases in the 5-year cycle brood year.

There is no doubt but that here, again, the deferring of the opening date to July 1 was in part responsible for the smaller catch. This is borne out by the



conditions as found on the spawning grounds, and obviously quite a large percentage of the run escaped the fishing gear. There is no doubt, however, that the Skeena river requires very close attention for some years to come in order that there may be no question of serious depletion. Steps are being taken looking to the confining of fishing more to the outside waters and so to relieve the river itself where the intensive fishing in such a more or less shallow stream would have the tendency to "cork" the river.

The canneries on the Skeena have in recent years been going farther afield for their sockeye supplies and have been making a portion of their collections from such areas as Principe and Grenville channels. This portion of the pack, however, is kept separate from that composed of fish running to the Skeena river itself, and, of course, is not included in the figures cited above.

Rivers and Smiths Inlets.—One of the bright spots in the year's salmon fishery was the unusually large pack of sockeye at Rivers and Smiths inlets. The total for the year was 166,686 cases, as against 89,575 cases in the previous year, 92,872 cases in the 4-year cycle brood year, and 150,398 cases in the 5-year cycle brood year.

At these two inlets conservation measures are made somewhat easier by the great depth of water and the fact that the fishing boundaries are being maintained in such positions as will assure a reasonable area of deep water above the boundaries as a sanctuary for the salmon while waiting to pass into the streams.

Some alarm has been felt at these two points, and particularly at Rivers inlet, owing to the intensive fishing especially in recent years. The number of boats used is considered to be very greatly in excess of the number which is justified, having in view a reasonable remuneration to the fishermen and the canners. It appears to have been clearly demonstrated, however, that with the advent of power boats the noise and disturbance produced on the surface by the numerous craft concentrated in a more or less confined area frightens the salmon and often causes them to swim below and pass under the nets of the fishermen.

In view of the size of the 1935 pack it might be suggested that too great a percentage of the fish had been taken, but the examination of the spawning grounds shows beyond doubt that a reasonable portion of the run escaped the fishing areas and was able to spawn naturally, assuring a good run in future cycle years.

*Fraser River Area.*—No large pack was expected in this district but the output of 57,212 cases in the year under review compares favourably with 38,507 cases of the brood year of 1931, the Fraser River sockeye being predominantly four year fish. The difference in the totals is the more gratifying when it is realized that a much smaller percentage of what is known as the late run was taken by the fishermen. A suggested reason for the smaller toll from the late run is that the sockeye did not remain out in the gulf of Georgia for such a long period as has been the case during the several preceding cycle years, but passed up the river to the spawning grounds in a more regular way and largely during the week in which a special closure of the river was enforced, for just such a purpose. This statement would appear to be borne out by the fact that the spawning grounds to which the late run proceeds were found well supplied.

Reference to Statement No. 15 shows that from the run of sockeye proceeding to the Fraser river, including the catch by all methods of fishing, and in the Puget Sound waters and those of the strait of Juan de Fuca, through which the salmon approach the river, the pack for the year was 117,499 cases, compared with 124,675 cases in the brood year, 1931. This would seem to show that the fishermen in Puget sound had obtained a good share of the late run of sockeye before it reached the Canadian side, although the total caught in that

district in 1935 was not as great as in the brood year. One reason for the smaller catch in Puget sound is undoubtedly the elimination of the numerous salmon traps which have operated for many years in those waters.

*Cohoos.*—The pack of cohoes in 1935 was the largest on record; 216,173 cases. The average for the past five years was 157,336 cases, and during the past fifteen years 148,023 cases. The quantity of cohoes canned varies considerably from year to year, depending upon cold storage demand for this species of salmon. The fifteen years' production, arranged in 5-year averages, is shown as follows:—

	Cases
1921-1925.....	127,325
1926-1930.....	159,408
1931-1935.....	157,336

Notwithstanding the large pack in 1935, the escapement to the spawning grounds was good, generally speaking, all along the coast.

*Pinks.*—Below is a statement showing the 2-year average in the pack of pinks from 1921 to the end of 1935. The 1935 pack, 514,966 cases, compares very favourably with the 1934 figures, 435,364 cases, and those of the brood year, 532,558 cases. This was the year of the big run to the Fraser river and lower part of the mainland generally and apparently the supply is being well maintained. The statement follows:—

	Cases		Cases
1922-1923.....	511,455	1930-1931.....	659,466
1924-1925.....	551,480	1932-1933.....	378,137
1926-1927.....	510,305	1934-1935.....	475,165
1928-1929.....	635,165		

*Chums.*—Comparison with canned chum output for the years since 1920, arranged to show 5-year averages, is as follows:—

	Cases
1921-1925.....	385,213
1926-1930.....	590,684
1931-1935.....	315,835

The total pack in 1935 was 409,604 cases, as compared with 513,184 cases in the previous year. With one exception, the pack for 1934, the production of canned chums was the largest since 1929.

#### EXPORTS OF CANNED SALMON FROM PORT OF VANCOUVER

Following is a statement showing the exports of canned salmon, according to countries of destination, from the Port of Vancouver during the year:—

	Cases		Cases
Africa, South.....	62,838	Africa, West.....	3,786
Africa, East.....	2,170	Africa, North.....	50
	Cases		Cases
Australia.....	367,358	Italy.....	130
Belgium.....	12,028	India.....	8,972
Bolivia.....	150	Japan.....	12
Canary Islands.....	30	Mauritius.....	575
Central America.....	100	New Zealand.....	41,044
Chile.....	595	Panama.....	1,095
China.....	819	Peru.....	50
Columbia.....	764	Philippine Islands.....	12,825
Denmark.....	75	South America, n.e.s.....	3,097
East Indies.....	275	South Sea Islands.....	2,791
Eastern Canada.....	159,824	Straits Settlements.....	701
Egypt.....	849	Sweden.....	265
Fiji Islands.....	9,938	United Kingdom.....	398,639
France.....	61,111	U.S.A. Pacific.....	22,049
Germany.....	2,643	West Indies.....	13,569
Holland.....	110		

The total, 1,191,327 cases, exceeded the 1934 exports from Vancouver by nearly 168,000 cases.



## CANNED SALMON—FRENCH QUOTA

Arrangements with France under the trade agreement of 1933 made available to the Canadian industry for the calendar year 1935 a quota of 49,660 metric quintals of canned salmon, equivalent to 10,923,889 pounds. These arrangements affected canned pinks and chums which are the only varieties of canned salmon exported in quantity to France from this province. The distribution was made amongst the Canadian salmon canners on the basis of the total pack of pinks and chums by each operating company during the operating season of 1934.

The quota has proved very helpful to the Canadian industry and has made available a satisfactory market for this considerable portion of the pack of the fall varieties of salmon, which, under other conditions, probably would have remained in first hands for much longer periods, with resultant reduction in profit.

Certificates of origin, numbering 460, representing an equal number of shipments, were issued at the department's British Columbia office, covering exports under the quota.

## INSPECTION OF CANNED SALMON

As a result of the experience gained in the operation of the canned salmon inspection regulations, which came into effect on June 1, 1932, there was a feeling by a number of those interested that some alterations should be made. The opinion was held that the placing of a second top with the words "Second Quality" on all cans of salmon which failed to qualify for a certificate was too drastic a requirement and was too heavy a penalty in view of the fact that the contents of the cans were quite fit for human consumption and were saleable at a profit in certain markets, providing the designation in question was altered. The regulations were amended to provide for a second top bearing the words "Grade B" instead of "Second Quality."

The ground was also taken in the industry that notwithstanding that the regulations really provided for an appeal from the decision of the inspector first passing on a consignment, since his decision required to be confirmed by the other two inspectors in the case of the parcel not being found entitled to a certificate, there should be an appeal to some authority quite apart from the members of the Inspection Board. The wishes of the industry were met by providing for an Appeal Board composed of one member to be appointed by the chairman of the Canned Salmon Section of the Canadian Manufacturers' Association, one member by the owner of the parcel concerned, and the third member by the department's Chief Supervisor of Fisheries for British Columbia.

Whilst the present board is composed of three prominent salmon brokers whose names were recommended to the department by the industry, it was always understood that the principle of employing, as government inspectors, those engaged in the buying and selling of canned salmon was not a desirable one. In view of the fact, however, that there were not available other properly qualified men who could be employed as inspectors and give their whole time to the duties of those positions, it was agreed that the Canned Salmon Inspection Board established under the original plan should continue but only until the department found and trained a sufficient number of men to replace the present inspectors.

During the year under review final steps were taken looking to the appointment of one university graduate in science, with special training in physics, chemistry and mathematics, and familiarity with pure research methods, and in addition, two senior laboratory assistants, with at least two years of university training, preferably in physics and chemistry, who would be placed on the staff of the office of the Chief Supervisor in Vancouver, and on April 1, 1936, replace the present Inspection Board.



Mr. F. Charnley, of the staff of the Fisheries Experimental Station at Prince Rupert, was appointed by the Civil Service Commission to fill the senior position, and arrangements were made for the appointment of two other officers immediately after the first of the calendar year.

The following statement gives the particulars of inspections made during the calendar year 1935:—

Number of inspections made.....	3,950
Total number of cases inspected.....	1,490,851
Total number of cases below certificate standard.....	43,827
Total number of cases available for certificate.....	1,447,024
Total amount of fees paid.....	\$ 14,873 91

#### DETAILS OF CANNED SALMON INSPECTIONS, ACCORDING TO SPECIES

Species	Number of cases inspected	Number of cases below certificate standard	Number of cases available for certificates
Sockeye.....	338,762	8,614	330,148
Springs.....	23,055	518	22,537
Steelheads.....	965	5	960
Bluebacks.....	16,367	84	16,283
Coho.....	226,453	5,852	220,601
Pinks.....	503,504	18,878	484,626
Chums.....	381,745	9,876	371,869
Totals.....	1,490,851	43,827	1,447,024

#### PARTICULARS OF NON-CERTIFIED CANNED SALMON ACCORDING TO SPECIES

Species	Below Grade B	Grade B	Tips and Tails	Totals
	Cases	Cases	Cases	Cases
Sockeye.....		6,646	1,968	8,614
Springs.....		518		518
Steelheads.....		5		5
Bluebacks.....			84	84
Coho.....		5,831	21	5,852
Pinks.....	129	18,749		18,878
Chums.....		9,876		9,876
Totals.....	129	41,625	2,073	43,827

By reference to Statement No. 19 there will be found particulars of the inspections since the inception of the regulations, showing the quantities and percentages of canned salmon passed as eligible for certificate and that graded as second quality.

This statement is significant, and particularly interesting because of the contention of certain of the canners that Grade B quality canned salmon should be permitted to be marketed in competition with that of better grade without having any distinguishing mark in the way of Grade B tops. The view of those supporting the present regulations is that permitting the suggested action would drag down the value of the first quality salmon to that of the Grade B shipments, which, on the basis of inspection results of the past four years would mean that 1·67 per cent of the canned salmon pack, graded B, would drag down to its approximate level the value of the balance, or 98·33 per cent. One of the primary reasons for the inspection, of course, is the protection of the consuming public, but the enormous loss suggested by these percentage figures is in itself a sufficient reason for the condition in the regulations designating inferior quality as such.

## DRYSALTED SALMON

When it came into being in the fall of 1934, the British Columbia Salt Fish Board found the salmon season was too far advanced to make it feasible to undertake control of the drysalt salmon pack of that year. In 1935, however, the board set a limit of 35,000 boxes on the pack of drysalt chum salmon, but did not put any restrictions on the drysalt of other varieties of salmon. These latter species are not salted in quantities sufficiently large to affect the marketing of chums, which are all in Japan.

The allotment of 35,000 boxes was divided amongst thirty-one salmon drysalters operators licenced by the Provincial Government. A total of 9,800 boxes was permitted for the west coast of Vancouver island, and 25,200 for the east coast of Vancouver island and the mainland.

The amount of drysalt salmon actually marketed and shipped was 37,562 boxes.

The past season, on the whole, might be considered as satisfactory from the standpoint of drysalt operations, showing an increase of 37.78 per cent in the pack of salt chums over that of the previous year.

Some dissatisfaction was felt by the Fraser River fishermen as the limit set by the Marketing Board had the effect of eliminating them from drysalt salmon operations. Before the Chum salmon commenced to arrive in material quantities in the Fraser River district, supplies were brought in from the waters of District No. 3 in sufficient quantity to fill the requirements of drysalters situated in District No. 1, and as a result there was no market for the later catches of the Fraser River fishermen.

The following statement shows the production of the several varieties of dry salted salmon in each year since 1925:—

	Sockeye	White Springs	Cohoos	Pinks	Chums	Totals
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
1925.....		4,580		2,137	131,737	138,454
1926.....					139,858	139,858
1927.....					81,170	81,870
1928.....			48		170,205	170,253
1929.....					77,362	77,362
1930.....				1,291	114,932	116,223
1931.....	520	9,743	4	40,371	336,055	386,693
1932.....		8,142			119,147	127,289
1933.....		89		7,469	75,317	82,875
1934.....			2		90,979	90,981
1935.....	4	1,354	34	6,173	139,076	146,641

## SALMON IMPORTS AND EXPORTS—FRESH

In view of the removal of the embargo on the export of fresh sockeye salmon from British Columbia, the following statement of all varieties exported from and imported into the province during the year will be found of interest:—

## IMPORTS OF FRESH SALMON

	Sock-eye	Springs	Cohoos	Chums	Steel-head	Pinks	Total
From A.aska.....	3,150	4,903	33,110	2,380			43,543 fish
Equivalent in cases.....	225	702	3,941	283			5,151 cases
Actually canned (cases)....	225		150				375 cases
Balance frozen (cwts.).....		4,903	3,176	238			8,317 cwts.

## EXPORTS OF FRESH SALMON

To Washington State.....	47,291	276,470	900	200	20	99,237	424,118 fish
Equivalent in cases.....	3,941	65,826	100	25	2	6,202	76,096 c/s

## REMOVAL OF SOCKEYE EMBARGO

The prohibition of the export of sockeye salmon in a fresh state from British Columbia, which had been in effect since 1894, was removed in time to affect operations in the sockeye season of 1935. The prime purpose of the prohibition had been to protect the valuable canning industry of the Fraser River district, which is contiguous to the waters of Puget sound, as it was felt that foreign competition there was of such a nature as to make impossible the operation of the salmon canners in the lower part of British Columbia unless the Canadian canners were given protection by means of the embargo. Conditions in recent years have changed considerably, however, and it is now felt that there is no longer any justification for retaining the embargo, particularly as the fishermen feel strongly that since, at times, the Canadian canners are not in a position to buy certain portions of their salmon catch, they should be given the opportunity to take advantage of any sales opportunities which may be found elsewhere.

## FROZEN SALMON—FRENCH QUOTA

This was the second year in which shipments of Canadian frozen salmon were made to France under the quota system. The quantity made available to the Canadian industry for the calendar year 1935 was 3,000 metric quintals or a total of 660,000 pounds. This quota was allotted to the Canadian companies interested on the basis of the quantities of the several varieties usually exported to France which they placed in cold storage during the 1934 season.

## PRICES FOR SALMON

Salmon prices for the year were fairly satisfactory. Generally speaking, the returns to the industry showed some improvement over those for several of the immediately preceding years.

## SALMON CATCH BY THE SEVERAL METHODS OF FISHING

Statement No. 17 shows the catches of the several varieties of salmon by the various methods of fishing employed during the year.

The total catch by all methods was 21,685,299 fish, compared with 24,723,242 in 1934 and 18,540,542 in 1933.

## POWER BOATS—SALMON GILL-NET FISHING

There were 2,807 power boats used in District No. 2 salmon gill-net operations during the year, as compared with 2,922 in the preceding year. The reduction was due to efforts made by the industry to keep down the total number of boats used in this method of fishing and so to avoid extra weekly closed seasons, which are largely used by the department for the purpose of conservation.

## LICENCES

There were 6,216 salmon gill-net licences issued during the year, and 43 licences for salmon canneries. The number of purse-seines, however, was practically the same as in the preceding year.

Statement No. 13 sets out the licence figures.

## HALIBUT

The landings of halibut in Canadian ports totalled 171,143 hundredweights or a reduction of 11,459 hundredweights from the landings of the previous year. Landings by Canadian fishermen totalled 101,927 hundredweights and the quantity landed in British Columbia by United States vessels was 69,216



hundredweights. In the landings by Canadian vessels in Canadian ports there was an increase of 4,246 hundredweights over the previous season. In the landings by American boats in Prince Rupert there was a decrease of 15,989 hundredweights. It is interesting to note that for the year under review the landings at Seattle increased by 16,635 hundredweights.

A board was set up by Order in Council of June 8, 1935, under the authority of the Natural Products Marketing Act of 1934, and is known as the British Columbia Halibut Marketing Scheme. It contemplates the regulation of the marketing of halibut caught in Pacific coastal waters by Canadian boats, including the licensing of captains, registration of producers, and the determination of the quantity of the regulated product that shall be marketed by any person during any period of time, subject, of course, to the provisions provided by the regulations under the Pacific Halibut Fishery Convention.

The board consists of seven members, two being captains elected by the captains fishing out of the port of Prince Rupert, two registered producers, other than captains, elected annually by the registered producers, other than captains, fishing out of the port of Prince Rupert, one captain elected annually by the captains fishing out of the port of Vancouver, and one registered producer, other than a captain, elected by the registered producers, other than captains, fishing out of the port of Vancouver. In addition there was provision for the appointment of one other person, who is to be chairman.

The principal regulations promulgated by the board were as follows:—

"8 (a) Ordinary tie-up in port shall date from noon of the day on which a vessel first arrives in Prince Rupert, Butedale, Vancouver, or New Westminster, if the vessel arrives before noon, and from noon of the next day if the vessel arrives after noon and shall be as follows,—seven (7) full days for boats carrying three (3) men or less (including captain), eight (8) full days for boats carrying four (4) or five (5) men (including captain), nine (9) full days for boats carrying more than five (5) men, (including captain).

"(b) Ordinary tie-up shall be increased as follows,—two (2) full days for each one thousand (1,000) pounds or fraction thereof above the permitted quota.

"(c) Ordinary tie-up shall be decreased as follows,—one (1) full day for the first full two thousand (2,000) pounds short of permitted quota and one (1) full day for each further full one thousand (1,000) pounds short of quota.

"(d) Quotas shall be as follows: Area 3—thirty-eight hundred (3,800) pounds a man a trip (including captain) plus nine hundred and ninety-nine (999) pounds; Area 2—thirty-one hundred (3,100) pounds a man a trip (including captain) plus nine hundred and ninety-nine (999) pounds.

"(e) When breakdowns necessitate going into port for repairs all time lost over twenty-four (24) hours shall be deducted from the tie-up time immediately following breakdown.

"9. In addition to the penalties provided by the Marketing Act for infraction of these rules by fishermen and captains, any captain breaking or infringing these regulations shall be liable to have his licence cancelled by the board.

"10. Each captain shall give full information as to the size of his catch and the area from which it is taken, to the board, within forty-eight (48) hours after discharge of fish, providing that a captain who regularly furnishes statistical information to the International Fisheries Commission may be exonerated from the above if he authorized in writing the International Fisheries Commission to turn over their statistical data to the board."

Area No. 2 was closed by order of the International Fisheries Commission on September 6 as the commission was of the opinion that the quota for the area would be reached by that date. Fishing in Area No. 3, however, was continued until December 26 to permit of the quota for that region being reached.

On the opening of halibut fishing on March 1, the Canadian boats remained in port for some three weeks, due to a disagreement between the fishermen and vessel owners as to the division of the proceeds as a result of the sale of halibut livers. Those concerned had been operating on an agreement which has been in existence for approximately twelve years and probably there would not have been any difficulty had it not been for the fact that the price for halibut livers had increased rapidly. Instead of fishermen receiving 11 cents or 12 cents per pound, the price paid during 1935 was 40½ cents at Prince Rupert and 42½ cents at Vancouver, per pound. That of the preceding year was 23 cents per pound.

A new agreement between Canada and the United States regarding tariffs has reduced the tariff on Canadian halibut going to United States markets by 50 per cent, as from January 1, 1936; in other words, the duty has been reduced from 2 cents to 1 cent per pound. The change should be helpful to the Canadian industry.

#### DRYSALTED HERRING

Under the operations of the British Columbia Salt Fish Board the 1935 pack of drysalt herring in British Columbia was restricted to 23,000 tons, divided amongst twenty-one operators licenced by the Provincial Government, nine of these on the west coast of Vancouver Island and twelve on the east coast.

The allotment for the west coast plants amounted to 7,200 tons and that for the east coast plants 15,800 tons.

The pack was restricted because of the unsatisfactory financial conditions obtaining in the Orient. As the season advanced, however, it was found necessary to restrict the pack still further in order to save the industry from a serious financial loss, and the actual amount marketed was 14,333 tons. The board felt that if a larger quantity had been shipped it would have been necessary to dispose of it at sacrifice prices. As it was, the British Columbia packers received a higher average price for their drysalt herring in 1935 than in the previous season.

For particulars of the pack since 1918 see Statement No. 8.

The supply of herring along those portions of the coasts of Vancouver island where runs usually occur, was particularly large, and had the catch not been limited under the operations of the Salt Fish Board a huge pack could have been put up.

Authority was granted for catching herring for reduction purposes during the year and fishing operations in this connection were commenced on November 16. Between that date and the close of the calendar year 23,046 tons of herring were landed for use by the fish reduction plants. When operations ceased on the west coast, however, and after that time, large quantities of herring were still available. Three reduction plants operated in Barclay sound and two in the Nootka area. The landings at the Barclay sound plants were practically all from Barclay sound waters, while the Nootka operators obtained their supplies from Kyuquot sound and Nootka sound.

#### PILCHARDS

The runs of pilchards were quite satisfactory, although weather conditions, time lost in spotting schools, and the distance from the plants reduced profit somewhat. Fishing was permitted from July 1 this year instead of July 5 as in the past, but actual operations did not commence until July 10.

Particulars of the quantity of pilchards canned since 1917 will be found in Statement No. 9.

#### WHALING

There was a decrease of 148 in number of whales taken during the year, the principal decrease being in the capture of sperms, which are the most valuable. The catch varies from year to year, largely owing to the migratory habits of the whales and also because of changing weather conditions. Statement No. 11 covers the results of whaling operations.

#### FISH MEAL AND OIL

Statement No. 10 records the production of fish meal and oil since the year 1920. Herring oil shows an increase of approximately 200 per cent, but there was a reduction of approximately 50 per cent in the oil and meal produced from whales.



## OYSTERS

There were 1,087 cases of oysters canned during the year and 2,266 barrels were used fresh. The Japanese variety, which has been imported to British Columbia waters in the form of spat, is known on this coast as the Pacific oyster. Its introduction to the waters of this province has been a real success, the growth being rapid and the flavour delicious. There was some doubt as to this variety reproducing in the waters of this coast, but recent experiments have shown that there has been natural reproduction in certain seasons, and this has naturally been encouraging to the operators of beds.

## CLAMS

The clam fishery, which includes canning operations as well as marketing fresh, continues to be reasonably prosperous. There were 10,212 cases canned and 7,855 barrels marketed fresh. Considerable shipments from the beds along the east coast of Vancouver island were made during the latter part of the year to buyers in the state of Washington.

## FUR SEAL SKINS

The total number of fur seals taken by Indians during the year was 841, compared with 256 in the previous season. Despite this increase over 1934 catch, the 1935 take was very small compared with the average during the last fifteen seasons. The falling off in recent years has been largely due to the low price the Indians obtained for raw fur seal skins. Difficult weather conditions for hunting seals by means of canoes and the intensive salmon fishing in which the Indians engage each season have also contributed to the reduction.

The increased catch in 1935, as compared with 1934 results, was due, in a measure, to the fact that the Biological Board was paying \$2 for full stomach and \$1.50 per empty stomach, which were required for the purpose of its investigation into the food of the seals.

Statement No. 12 gives figures as to fur seal catch over a period of years.

## DESTRUCTION OF SEA LIONS

The usual annual hunting expedition for the purpose of controlling the number of sea lions opposite the valuable salmon gill-net areas of Smiths and Rivers inlets resulted in the destruction of 513 adults and 110 pups.

The numbers killed are not always indicative of the population in the several hauling-out places, since hunting operations are largely affected by weather conditions. The Pearl and Virgin Rocks, which appear to be among the favourite haunts of sea lions, are exposed to the full sweep of the Pacific ocean, and the conditions have to be unusually good before a landing can be made.

The fishermen are becoming more and more insistent that these hunting operations be extended to include points off the west coast of the Queen Charlotte islands, in Hecate straits, off the west coast of Vancouver island, and in the gulf of Georgia.

Any serious effort looking to a material reduction in the numbers at all these points would be a major operation, and, as an addition to the regular work of patrol boats, would involve considerable expense. Whilst there is no doubt that good results are being obtained at the points at present receiving attention by the annual departmental hunting expeditions, it has not yet been definitely demonstrated that the department would be justified in extending the present operations in a large way.



## PATROL SERVICE

Boats used in the patrol of the fisheries service during the year numbered 112, of which 21 are departmentally owned. Power boats numbering 82, and 9 rowboats, were chartered for periods of from one to six months.

The two steam vessels used in the fisheries protection service, *Malaspina* and *Givenchy*, were kept very busy during the season, as usual, and particularly towards the end of the year, due to the extension of the halibut season to December 26, nearly a month longer than usual. This late closing date will, of course, result in delaying the annual overhaul of each of the vessels. Completion of the overhaul of the *Givenchy* during recent years has not been possible until after the first of the following fiscal year, as the result of life-saving duties which she is required to perform on the west coast of Vancouver island during portions of December and January.

During the year the *Malaspina* logged 24,337 miles, and the *Givenchy* 17,672 miles.

The patrol by means of seaplanes was carried on for 302 hours 50 minutes, as shown by the following statement:—

Base	Hours	Minutes
Alert Bay.....	51	45
Nanaimo.....	53	55
Swanson Bay.....	160	15
Vancouver.....	16	50
Prince Rupert.....	20	05
Total.....	302	50

## SUMMARY

Year	Hours	Minutes
1927.....	92	02
1928.....	261	30
1929.....	408	08
1930.....	443	40
1931.....	319	25
1932.....	275	25
1933.....	260	25
1934.....	262	10
1935.....	302	50

Another evidence of the efficiency of the air patrol is the recent request of the fishermen themselves for the increase of this service as they feel that by means of 'planes greater protection can be given to the salmon-fishing operations, particularly with a view to preventing operations inside the boundaries and during closed periods.

## VIOLATIONS OF THE REGULATIONS

Fishing, particularly by means of salmon purse-seines, was very intensive during the year. This method of fishing is becoming more efficient each year as a result of more experienced men becoming available in connection with these operations and a bigger, faster and more capable type of boat being used. In consequence, the difficulties of patrol are considerably increased, especially as it is difficult to obtain, for charter, boats which have the necessary speed to cope with the improved class of seine boat.

Considerable difficulty has been experienced during the year in the way of operators of salmon purse-seines tying their nets to the beach in violation of the fishery regulations. This, of course, has the result of making the seine to all intents and purposes a floating trap, and much more deadly, as a consequence, than normal operation.

There is no doubt but that to meet conservation needs satisfactorily the fishery patrol service must keep pace with the better equipment being used in the industry. The seaplane is an excellent supplement to other agencies of patrol.

Owing to the urgent necessity for economy during recent years, the patrol service has been cut to the bone and is at the lowest possible limit consistent with any reasonable protection of the valuable fisheries of the province. Any further reduction in the facilities provided for patrol of the fisheries would merely result in inadequate protection, and the impossibility of being assured of a proper escapement of fish to the spawning grounds, particularly in the case of salmon. The situation is felt to be serious.

The following statement shows the number of violations in each district, together with the revenue received from fines and from sales of confiscated articles:—

	District No. 1	District No. 2	District No. 3	Total
Violations.....	74	46	90	210
Fines.....	\$ 1,088 00	1,783 10	1,996 50	4,867 60
Sales.....	156 01	276 57	53 32	485 90
Totals.....	\$ 1,244 01	2,059 67	2,049 82	5,353 50

A detailed statement of these cases will be found in Appendix No. 10.

#### HAIR SEALS

Many emphatic complaints have been received during recent years from the fishermen regarding depredations by the hair seals, which are numerous, particularly in the salmon gill-net areas. Often a fisherman will find, after raids by hair seals, or even one hair seal, that his net has been stripped of fish and nothing left but heads.

The contention is that these mammals are on the increase and the fishermen are pressing more strenuously each year for the restoration of the bounty which was paid by the department until the time the financial situation became so difficult.

#### STRIKES

The salmon gill-netters at Nitinat refused for two weeks to fish as they were not satisfied with the price offered for their catch. Finally, however, they decided to commence operations, with no increase in price.

In Barclay sound the salmon gill-netters remained inactive for one week, due to their dissatisfaction with the price offered for sockeye.

The gill-net fishermen at Bute inlet also ceased fishing for four days because of dissatisfaction with the price offered.

The salmon trolling fleet in the gulf of Georgia area, which usually commences trolling for blueback salmon on May 16, lost practically one month owing to a dispute between the fishermen and the buyers. One result of the strike, however, was a considerable reduction in the blueback catch. These fish are young cohoes and worth very much more to the industry in the fall, from the standpoint of weight and quality than when taken in the more or less immature stage as bluebacks.

## ENGINEERING BRANCH

In Appendix No. 5 of this volume will be found reference to matters which required attention during the year by the engineering branch of the department's service in British Columbia. These included clearing obstructions to the ascent of salmon and trout, clearing log jams or cutting channels through them, floating out logs from the streams, construction of fishways, work on hatchery buildings, assistance to biological branches of the service, assistance to the Provincial Game Board in its fish cultural operations and to angling associations, installation of permanent boundary signs, repairs to floats and wharves, etc.

## OBSTRUCTIONS IN SALMON STREAMS

Attention is called to the very serious menace to the supplies of spring salmon, which are such a large factor in the prosperity of the salmon trollers, particularly along the coasts of the Queen Charlotte and Vancouver islands, through the construction of huge dams for power and irrigation purposes in the Columbia river, 100 miles south of the international boundary. Although the river lies mostly in the territory of the United States, it provides a large percentage of the spring salmon runs upon which the trollers along the shores of British Columbia depend. Tagging operations by employees of the Biological Board have shown, for instance, that from 60 per cent to 70 per cent of the spring salmon caught by the trollers on the west coast of Vancouver island are heading for the Columbia.

It is inconceivable that the obstructions in question will not have a very disastrous effect on the salmon run to the river, notwithstanding the huge expenditure contemplated for the purpose of the installation of fishways and other facilities for taking care of the salmon. The probability of the runs of spring salmon off the coast of British Columbia being considerably reduced in the near future makes it all the more imperative that every precaution be taken to the end that the spring salmon runs to streams in the province be given the very best of protection.

## STAFF

The following statement shows the number of employees, both permanent and temporary, in the several branches of the service of the department in this province during the year: —

Supervisors, inspectors, general staff .....	62
Guardians .....	40
Patrolmen and boat crews .....	205
Fish culture .....	133
Removal of obstructions .....	38
Total .....	478

Due to more intensive salmon seining operations there appears reason to expect that more boats, patrolmen, and guardians will be required in the near future.

## RETIREMENT ON SUPERANNUATION

Retirements on superannuation during the year were as follows:—

	Years of service
Henry Hugh Mostyn Beadnell (Fishery Inspector).....	21
Herbert Coulson Crawford (Hatchery Superintendent).....	28
John Henry Castley (Hatchery Superintendent).....	25
John Latty Hill (Fishery Inspector).....	21



## SPORT FISHING

The excellence of sport fishing all over the province continues to be a great attraction to many tourists, as well as to residents. The tendency in this regard is towards more intensive fishing, which means greater attention in the way of patrol is required and intelligent restocking. During the year there were 285 plantings of eggs and fry, six different varieties of sport fish being handled, as shown on the following statement:—

Species	Number of plantings	Number of eggs	Number of fry
Atlantic salmon.....	1		4,803
Kamloops trout.....	217	2,491,751	2,977,467
Cutthroat trout.....	39	1,005,357	327,570
Brown trout.....	7		55,409
Steelhead trout.....	9		102,280
Eastern Brook trout.....	12	95,000	248,539
Totals.....	285	3,592,108	3,716,068

The angling associations of Vancouver island joined in one association known as the Affiliated Fish and Game Associations of Vancouver Island. Now, instead of the department dealing individually with thirteen associations on the island, negotiations can be confined largely to the one, which, of course, makes for efficiency and much greater convenience.

The mainland anglers, as is the case of those on Vancouver island, continue to be very helpful in sport fish affairs.

## SPAWNING REPORT

Generally speaking, the supplies of salmon found on the spawning grounds by the inspecting officers are considered quite adequate, and, in some localities such as Rivers and Smiths inlets, the sockeye supply is considerably above average.

The department's policy of conservation by means of lowering boundaries, thereby confining fishing operations more and more to areas distant from the mouths of streams, the lowering of boundaries in shallow rivers, and the use of closed periods, is apparently bringing the desired results. There are areas where unusual measures in recent years have been taken with a view to improving conditions, and although the packs of salmon in some of these have shown a decrease, the escapement to the spawning grounds in these particular cases has shown the wisdom of the unusual precautions taken.

It is pointed out that the small pack in any area does not necessarily mean that there has not been a good run; on the contrary, a small pack may be due to the department's conservation measures, results of which are reflected on the spawning grounds. It is a mistake, therefore, always to accept a small pack as an indication of a poor run.

The spawning conditions as found in the numerous areas are more particularly described farther on in this report.

## STATEMENT No. 1

## ANNUAL CANNED SALMON PRODUCTION IN BRITISH COLUMBIA

Year	Num- ber of can- neries oper- ated	Number of salmon licences issued					Pack canned										Totals
		G.N.	Troll	P.S.	D.S.	T.N.	Sockeye	Red Spring	Pink Spring	White Spring	Blue- back	Steel- head	Coho	Pink	Chum	cases	
1925.....	65	4,225	1,821	329	37	19	392,643	39,142	4,419	29,938	10,675	1,996	188,505	445,400	607,904	1,720,622	
1926.....	76	4,750	2,416	445	41	6	336,995	41,276	4,177	23,736	19,445	2,165	162,449	772,993	701,962	2,065,198	
1927.....	76	5,637	3,093	555	46	7	308,032	34,029	8,819	16,129	20,820	1,746	161,148	247,617	562,109	1,360,449	
1928.....	62	5,179	2,987	399	22	7	203,541	11,002	2,328	5,526	6,073	865	150,684	792,362	863,256	2,035,637	
1929.....	63	5,609	2,630	371	24	7	281,306	8,295	3,156	7,926	22,246	672	174,198	477,969	424,982	1,400,750	
1930.....	59	6,061	3,115	343	21	7	477,678	20,184	6,650	11,970	42,033	1,656	148,561	1,111,937	401,114	2,221,783	
1931.....	35	4,893	3,115	228	21	7	291,464	17,526	4,727	4,894	25,296	1,326	76,879	206,995	55,997	685,104	
1932.....	44	5,359	3,033	157	30	7	284,355	46,953	14,133	14,974	28,505	1,168	160,466	223,716	306,761	1,081,031	
1933.....	49	6,113	2,880	238	31	8	258,107	12,464	1,849	5,953	21,763	1,459	137,289	532,558	293,630	1,265,072	
1934.....	49	6,826	3,099	296	9	8	377,882	15,281	1,644	12,859	29,556	1,282	195,874	435,364	513,184	1,582,926	
1935.....	43	6,216	3,002	293	9	8	350,444	10,187	3,114	8,619	15,319	596	216,173	514,966	409,604	1,529,022	

NOTE.—Licences issued include transfers from one district to another, except in the case of purse seines after 1929.

## PACK OF CANNED SALMON ON THE NAAS RIVER—1925 TO 1935

STATEMENT No. 2

Year	Num-ber of can-neries oper-ated	Number of salmon licences issued				Pack canned									
		G.N. Troll	P.S.	D.S.	T.N.	Sockeye	Red Spring	Pink Spring	White Spring	Blue-back	Steel-head	Coho	Pink	Chum	Totals
						cases	cases	cases	cases	cases	cases	cases	cases	cases	cases
*1925.....	3	210				20,351	5,441	387	538		470	8,188	35,880	23,497	94,752
†1925.....						18,945	4,067	387	392		457	7,726	34,530	22,504	89,008
*1926.....	4	316				15,929	4,616	751	597		375	4,274	43,891	15,392	85,825
†1926.....						15,929	4,616	751	597		375	4,274	50,815	15,392	92,749
*1927.....	4	302				11,986	3,221	511	213		96	3,845	16,609	3,307	39,788
†1927.....						11,986	3,221	511	213		96	3,845	16,609	3,307	39,788
*1928.....	3	263				5,558	1,471	68	615		36	18,002	95,998	4,591	126,339
†1928.....						5,540	1,471	68	307		36	10,734	83,183	3,538	104,877
*1929.....	3	240				16,347	256	57	96			1,195	10,507	1,261	29,719
†1929.....						16,077	256	57	96			1,145	10,342	1,212	29,185
*1930.....	3	282				26,500	1,772	283	176		137	5,555	90,163	4,330	128,916
†1930.....						26,405	1,722	283	176		84	961	79,976	3,853	113,460
*1931.....	1	235				16,929	1,010	323	106			8,943	5,178	660	33,149
†1931.....						9,146	1,010	323	106			443	3,575	392	14,995
*1932.....	3	278				15,138	5,848	264	468		23	33,495	51,920	15,070	122,226
†1932.....						14,154	3,676	264	468		10	7,955	44,629	14,515	85,671
*1933.....	3	297				10,173	1,014	227	214		114	19,016	57,406	2,778	90,942
†1933.....						9,757	885	227	184		49	3,251	44,306	1,775	60,434
*1934.....	3	335				36,242	533	126	145		311	26,698	37,698	5,558	107,311
†1934.....						28,701	383	126	145		311	9,935	32,965	2,648	75,214
*1935.....	3	310				12,712	94	298	168		143	21,810	25,508	17,481	78,214
†1935.....						12,245	86	298	168		143	5,125	21,443	12,681	52,189

\* Pack of fish caught at Naas river regardless where canned. † Pack at Naas river regardless where caught.

NOTE.—Licences issued, except 1925, include transfers from other districts.



## STATEMENT No. 3

## PACK OF CANNED SALMON ON THE SKEENA RIVER—1925 TO 1935

Year	Num-ber of can-neries oper-ated	Number of salmon licences issued					Pack canned										Totals
		G.N.	Troll	P.S.	D.S.	T.N.	Sockeye	Red Spring	Pink Spring	White Spring	Blue-back	Steel-head	Coho	Pink	Chum		
																cases	
†1925.....	13	1,067	.....	.....	.....	.....	77,785	17,811	1,657	2,457	.....	700	38,029	127,226	10,687	276,352	
†1925.....	13	1,067	.....	.....	.....	.....	81,149	19,185	1,657	2,603	.....	713	39,168	130,083	74,308	348,866	
†1926.....	15	1,129	.....	.....	.....	.....	82,307	17,896	966	1,750	.....	764	30,153	170,586	46,382	350,804	
†1926.....	15	1,129	.....	.....	.....	.....	82,357	17,896	966	1,750	.....	764	30,209	210,064	63,527	407,533	
†1927.....	13	1,195	.....	.....	.....	.....	83,988	13,595	3,567	1,609	.....	646	25,209	38,903	9,656	177,173	
†1929.....	11	1,208	.....	.....	.....	.....	83,984	14,856	3,567	1,609	.....	580	25,623	38,761	18,659	187,639	
†1928.....	11	1,208	.....	.....	.....	.....	34,524	4,121	988	397	.....	231	18,751	191,812	11,792	262,016	
†1928.....	11	1,208	.....	.....	.....	.....	34,559	5,043	988	354	.....	241	30,194	209,579	17,751	298,709	
†1929.....	11	1,143	.....	.....	.....	.....	77,714	3,795	441	383	.....	13	37,138	94,846	3,625	217,955	
†1929.....	11	1,143	.....	.....	.....	.....	78,014	3,795	441	383	.....	13	37,456	95,305	4,835	220,242	
†1930.....	11	1,202	.....	.....	.....	.....	130,952	6,589	1,047	322	.....	60	24,191	214,266	3,327	380,754	
†1930.....	11	1,202	.....	.....	.....	.....	132,372	6,674	1,047	324	.....	58	29,203	275,642	5,057	450,377	
†1931.....	8	1,076	.....	.....	.....	.....	107,936	7,040	2,284	534	.....	768	20,146	41,264	3,893	183,865	
†1931.....	8	1,076	.....	.....	.....	.....	93,029	7,040	2,284	534	.....	768	10,737	44,807	3,610	162,809	
†1932.....	10	1,119	.....	.....	.....	.....	59,916	16,378	9,419	2,472	.....	404	48,312	58,261	38,549	233,711	
†1932.....	10	1,119	.....	.....	.....	.....	52,624	14,268	9,419	2,472	.....	365	20,549	32,519	28,756	160,972	
†1933.....	10	1,218	.....	.....	.....	.....	30,506	2,626	444	227	.....	267	39,896	95,783	15,714	185,463	
†1933.....	10	1,218	.....	.....	.....	.....	27,693	6,805	444	828	.....	201	21,366	79,932	10,970	148,239	
†1934.....	9	1,164	.....	.....	.....	.....	70,654	6,844	592	860	.....	114	54,470	125,163	24,388	283,085	
†1934.....	9	1,164	.....	.....	.....	.....	54,558	6,809	592	860	.....	131	21,298	27,628	6,242	118,118	
†1935.....	9	1,053	.....	.....	.....	.....	64,140	3,443	429	188	.....	12	45,512	99,412	31,807	244,943	
†1935.....	9	1,053	.....	.....	.....	.....	52,879	3,422	429	188	.....	14	23,498	81,868	8,122	170,420	

† Pack of fish caught at Skeena river regardless where canned.  
 NOTE.—Licences issued include transfers from other districts.

‡ Pack at Skeena river regardless where caught.

## PACK OF CANNED SALMON FROM FISH CAUGHT AT RIVERS INLET AND SMITHS INLET—1925 to 1935

STATEMENT No. 4

Year	Num-ber of can-eries oper-ated	Number of salmon licences issued					Pack canned									
		G.N.	Troll	P.S.	D.S.	T.N.	Sockeye	Red Spring	Pink Spring	White Spring	Blue-back	Steel-head	Coho	Pink	Chum	Totals
							cases	cases	cases	cases	cases	cases	cases	cases	cases	cases
1925.....	11	1,127	.....	.....	.....	.....	201,186	344	311	116	.....	10	4,887	7,675	11,501	226,030
1925.....	.....	.....	.....	.....	.....	.....	170,581	215	311	57	.....	.....	4,866	8,695	11,477	196,132
1926.....	12	1,483	.....	.....	.....	.....	89,866	535	249	160	.....	27	10,348	8,493	14,690	124,368
1926.....	.....	.....	.....	.....	.....	.....	74,629	473	189	142	.....	11	7,448	13,503	11,751	108,146
1927.....	13	1,842	.....	.....	.....	.....	101,053	463	530	321	.....	19	5,475	1,383	5,027	114,271
1927.....	.....	.....	.....	.....	.....	.....	87,145	322	530	321	.....	17	4,980	1,402	3,617	98,324
1928.....	11	1,541	.....	.....	.....	.....	93,361	458	443	157	.....	13	9,761	3,130	9,200	116,523
1928.....	.....	.....	.....	.....	.....	.....	88,875	156	443	152	.....	13	1,098	16,703	3,628	111,066
1929.....	13	1,577	.....	.....	.....	.....	79,548	546	215	127	.....	47	8,270	3,112	6,536	98,401
1929.....	.....	.....	.....	.....	.....	.....	77,669	140	239	107	.....	41	3,239	1,340	1,091	83,866
1930.....	12	1,833	.....	.....	.....	.....	150,398	614	383	229	.....	182	6,760	17,476	18,372	194,414
1930.....	.....	.....	.....	.....	.....	.....	141,684	275	383	215	.....	208	2,084	34,638	2,135	181,622
1931.....	5	1,433	.....	.....	.....	.....	92,872	218	61	183	.....	69	5,536	2,296	544	101,779
1931.....	.....	.....	.....	.....	.....	.....	80,732	200	82	165	.....	68	6,633	3,724	562	92,216
1932.....	10	1,754	.....	.....	.....	.....	86,110	405	236	145	.....	56	11,871	4,305	5,516	108,644
1932.....	.....	.....	.....	.....	.....	.....	85,358	128	236	143	.....	49	7,535	4,305	1,109	98,989
1933.....	11	1,962	.....	.....	.....	.....	119,548	606	108	243	.....	153	9,078	11,658	8,932	150,326
1933.....	.....	.....	.....	.....	.....	.....	114,046	454	108	241	.....	169	8,614	25,054	9,518	158,103
1934.....	11	2,318	.....	.....	.....	.....	89,575	532	82	129	.....	121	11,862	2,928	14,375	119,604
1934.....	.....	.....	.....	.....	.....	.....	82,828	390	82	128	.....	122	8,793	9,769	16,444	118,556
1935.....	8	2,023	.....	.....	.....	.....	166,656	138	352	155	.....	63	9,576	8,966	19,563	205,499
1935.....	.....	.....	.....	.....	.....	.....	129,591	94	306	146	.....	49	917	6,045	7,128	144,216

NOTE.—Figures shown in roman are packs from fish caught at Rivers inlet or Smiths inlet. Figures shown in italics are actual packs irrespective of where fish taken and not including fish shipped out for canning in other districts. Licences issued include transfers from other districts.

## PACK OF CANNED SALMON IN THE FRASER RIVER DISTRICT—1925 TO 1935

Year	Num- ber of can- neries oper- ated	Number of salmon licences issued					Pack canned									
		G.N.	Troll	P.S.	D.S.	T.N.	Sockeye	Red Spring	Pink Spring	White Spring	Blue- back	Steel- head	Coho	Pink	Chum	Totals
1925.....	10	969	50				31,523	7,335	873	25,482	5,107	45	36,717	99,800	66,111	272,993
1926.....	10	1,063	59				83,589	11,774	1,030	20,130	14,036	39	21,787	32,256	88,493	273,134
1927.....	10	1,249	111				57,085	6,553	1,351	10,493	10,621	37	24,079	102,535	67,259	280,013
1928.....	8	1,303	109				26,530	1,173	248	3,661	795	.....	27,061	2,881	193,106	255,455
1929.....	9	1,473	113				60,407	2,984	912	5,977	11,960	53	40,540	158,290	144,208	425,331
1930.....	8	1,523	115				107,896	8,300	3,066	9,761	27,857	22	25,535	30,754	68,946	282,137
1931.....	7	1,358	154				54,688	5,970	1,185	3,187	14,697	4	13,468	21,534	948	115,681
1932.....	8	1,446	166				83,447	19,994	3,622	11,020	16,558	23	28,685	9,813	45,100	218,262
1933.....	10	1,685	110	64			53,481	5,701	426	4,554	13,299	.....	25,715	143,058	77,330	323,564
1934*.....	11	1,803	98	105			145,579	5,495	263	11,072	22,566	.....	30,751	35,847	219,331	470,904
1934†.....							133,159	4,713	173	10,760	1,607	.....	10,991	342	103,081	264,826
1935*.....	10	1,663	124	108			76,415	5,181	326	6,783	7,701	.....	63,933	182,528	72,353	415,220
1935†.....							57,212	4,205	212	4,984	350	.....	24,600	111,328	8,227	211,118

\*Represents actual pack, regardless where caught.

†Represents pack of Fraser fish, regardless where canned.

NOTE.—Licences issued include transfers from other districts.



## DEPARTMENT OF FISHERIES

## STATEMENT No. 6

## PACK OF CANNED SALMON OF PUGET SOUND, U.S.A., FROM 1925 TO 1935

Year	Number of canneries operated	Spring	Sockeye	Coho	Chum	Pink	Steel- head	Total
		cases	cases	cases	cases	cases	cases	cases
1925.....	23	28,268	106,064	171,587	41,635	555,848	141	903,543
1926.....	14	27,763	44,569	120,846	112,411	2,125	63	307,777
1927.....	21	43,443	96,343	133,528	37,414	585,506	216	896,450
1928.....	12	24,628	61,044	92,770	145,735	5,816	265	330,258
1929.....	21	32,600	111,855	101,363	150,867	727,748	280	1,124,713
1930.....	13	29,378	352,194	122,691	64,234	3,712	397	572,606
1931.....	18	28,066	83,728	76,025	55,189	705,580	293	948,881
1932.....	10	23,964	78,319	60,740	146,151	1,677	60	310,911
1933.....	19	20,869	125,738	44,568	37,039	543,340	222	771,776
1934.....	20	14,398	352,579	69,254	73,337	3,606	.....	513,174
1935.....	14	9,737	54,677	71,985	15,604	377,445	.....	529,448

## STATEMENT No. 7

## STATEMENT OF HALIBUT LANDINGS—BRITISH COLUMBIA—1913 TO 1935

	Cwt.		Cwt.
1913.....	223,465	1924.....	331,382
1914.....	214,444	1925.....	318,240
1915.....	194,896	1926.....	315,095
1916.....	123,062	1927.....	271,354
1917.....	113,529	1928.....	302,820
1918.....	186,229	1929.....	304,364
1919.....	210,777	1930.....	254,796
1920.....	238,770	1931.....	182,005
1921.....	325,868	1932.....	168,847
1922.....	293,184	1933.....	170,372
1923.....	334,667	1934.....	182,602
		1935.....	171,143

## STATEMENT No. 8

## STATEMENT OF DRY SALT HERRING PACKS, 1918-1935—BRITISH COLUMBIA

Year	District No. 1	District No. 2	District No. 3		Total
			East Coast	West Coast	
	cwt.	cwt.	cwt.	cwt.	cwt.
1918.....	20,000	.....	109,900	42,710	172,610
1919.....	4,000	.....	43,000	208,058	255,058
1920.....	807	1	176,640	334,720	512,168
1921.....	249	.....	231,200	248,482	479,971
1922.....	.....	.....	297,871	224,897	522,768
1923.....	.....	8,935	250,420	484,681	744,036
1924.....	.....	.....	305,266	548,277	853,543
1925.....	.....	4,120	591,162	487,892	1,083,174
1926.....	11,134	4,192	596,114	327,207	938,647
1927.....	24,380	7,600	542,385	473,825	1,048,190
1928.....	46,995	.....	748,032	277,161	1,072,188
1929.....	78,800	5,160	691,673	140,751	916,384
1930.....	19,114	.....	546,342	240,517	805,973
1931.....	.....	.....	668,506	119,721	788,227
1932.....	.....	.....	219,398	50,022	269,420
1933.....	.....	.....	448,944	64,080	513,024
1934.....	.....	.....	310,026	104,600	414,626
1935.....	.....	.....	280,290	22,420	302,710

## STATEMENT No. 9

## CANNED PILCHARD PACK—BRITISH COLUMBIA—1917 TO 1935

		Cases			Cases
1917.....		1,090	1926.....		26,731
1918.....		63,693	1927.....		58,501
1919.....		63,065	1928.....		65,097
1920.....		91,929	1929.....		98,821
1921.....		16,091	1930.....		55,166
1922.....		19,186	1931.....		17,336
1923.....		17,195	1932.....		4,622
1924.....		14,898	1933.....		2,946
1925.....		37,182	1934.....		35,437
			1935.....		27,184

## STATEMENT No. 10

## PRODUCTION FISH OIL AND MEAL—BRITISH COLUMBIA, 1920-1935

Year	From Pilchards		From Herring		From Whales			From Other Sources	
	Meal and fertilizer	Oil	Meal	Oil	Whale-bone and meal	Fertilizer	Oil	Meal and fertilizer	Oil
	tons	gals.	tons	gals.	tons	tons	gals.	tons	gals.
1920.....					503	1,035	604,070	466	55,669
1921.....								489	44,700
1922.....					326	230	283,314	911	75,461
1923.....					485	910	706,514	823	180,318
1924.....					292	926	645,657	1,709	241,376
1925.....	2,083	495,653			347	835	556,939	2,468	354,853
1926.....	8,481	1,898,721	310	13,700	340	666	468,206	1,752	217,150
1927.....	12,169	2,673,876	1,838	170,450	345	651	437,967	2,512	375,130
1928.....	14,500	3,995,806	831	68,411	376	754	571,914	3,658	411,207
1929.....	15,826	2,856,579	392	34,924	416	779	712,597	3,671	461,915
1930.....	13,934	3,204,058	915	60,373	273	581	525,533	2,420	182,636
1931.....	14,200	2,551,914	3,904	110,810				1,747	241,682
1932.....	8,842	1,315,864	6,195	186,173				413	45,517
1933.....	1,108	275,879	4,078	316,213	249	223	509,310	1,596	187,560
1934.....	7,626	1,635,123	2,570	104,710	340	631	813,724	2,458	337,025
1935.....	8,681	1,649,392	5,262	306,767	211	354	426,772	2,147	247,437

## STATEMENT No. 11

## NUMBER OF WHALES LANDED—BRITISH COLUMBIA, 1922-1935\*

Species	1922	1923	1924	1925	1926	1927	1928	1929	1930	1933	1934	1935
Sperm.....	38	94	83	76	80	82	83	146	147	190	265	175
Sulphur.....	4	62	56	29	14	10	47	16	10	1	.....	6
Fin.....	94	166	125	135	124	138	140	168	62	17	71	20
Hump.....	50	78	47	40	25	21	21	9	12	.....	14	1
Sei.....	1	53	100	68	25	7	13	67	89	1	.....	.....
Right.....	.....	.....	2	.....	1	.....	.....	.....	.....	.....	.....	.....
Bottlenose.....	.....	2	1	3	.....	.....	1	1	.....	.....	.....	.....
Totals.....	187	455	414	351	269	258	305	407	320	209	350	202

\* No whaling plants operated 1931 and 1932.

## DEPARTMENT OF FISHERIES

## STATEMENT No. 12

## STATEMENT OF FUR SEAL SKINS TAKEN AND LANDED, BRITISH COLUMBIA, 1912-1935

Year	District No. 2	District No. 3	Total
	No.	No.	No.
1912.....		205	205
1913.....	285	119	404
1914.....	95	257	352
1915.....	39	400	439
1916.....	21	138	159
1917.....	14	204	218
1918.....	78	10	88
1919.....	53	17	70
1920.....	502	556	1,058
1921.....	270	2,079	2,349
1922.....	291	639	930
1923.....	678	3,746	4,424
1924.....	370	1,862	2,232
1925.....	810	3,655	4,465
1926.....	655	2,169	2,824
1927.....	188	1,288	1,476
1928.....	465	1,625	2,090
1929.....	1,119	2,264	3,383
1930.....	195	2,102	2,297
1931.....	76	1,387	1,463
1932.....	88	1,699	1,787
1933.....	237	1,747	1,984
1934.....	98	158	256
1935.....	63	778	841

## STATEMENT No. 13

## STATEMENT OF SALMON LICENCES ISSUED—BRITISH COLUMBIA, 1919-1935

Kind of Licence	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
<i>District No. 1—</i>																	
Salmon cannery....	14	11	13	10	11	9	10	10	10	10	9	11	7	8	10	11	10
Salmon gill-net....	1,337	1,288	1,437	1,296	964	969	969	1,063	1,249	1,303	1,473	1,523	1,358	1,446	1,685	1,803	1,663
<i>District No. 2—</i>																	
Salmon cannery....	45	41	32	41	37	38	41	50	48	47	45	26	21	28	29	31	26
Salmon purse-seine	35	79	13	73	126	107	137	193	244	158	153	152	71	53	55	109	102
Salmon drag-seine.	81	38	30	30	20	19	15	14	16	9	9	9	9	9	11	9	9
Salmon gill-net:—																	
Lowe Inlet.....														29	59	67	58
Nas River.....	300	342	338	304	244	210	210	316	302	263	246	282	235	278	297	335	310
Skeena River....	1,153	1,153	1,109	1,091	900	941	1,068	1,129	1,198	1,208	1,143	1,202	1,076	1,119	1,218	1,164	1,053
Rivers Inlet....		871	1,000	1,012	987	770	891	1,115	1,273	1,117	1,149	1,449	1,144	1,461	1,603	1,899	1,699
Smiths Inlet....	916	1,373	215	179	197	193	236	368	570	424	428	384	289	293	359	419	324
Bella Coola....		193	241	165	134	146	139	192	195	173	236	359	240	238	228	285	268
Kimsquit.....				120	122	96	137	100	104	80	194						
Butedale.....	421	61	5		63	32	60	37	108	58	56	71	51	55	43	48	41
Namu.....		136	138	136	215	87	109	139	180	77	116	142	108	100	107	141	127
Queen Charlotte Islands.....		14	1	4	1	1	17	27	42	22	3	6	5	4	2	19	.....
Total, District No. 2.....	2,490	2,943	3,047	3,011	2,863	2,476	2,867	3,423	3,972	3,422	3,571	3,895	3,148	3,577	3,916	4,377	3,880
<i>District No. 3—</i>																	
Salmon cannery....	23	13	11	14	13	15	16	19	18	19	17	17	7	8	10	7	7
Salmon purse-seine	103	76	46	74	97	135	192	252	308	239	218	191	157	104	183	187	191
Salmon drag-seine.	23	7	5	10	11	13	22	27	30	13	13	12	12	21	20	.....	.....
Salmon gill-net....	771	530	293	176	142	251	390	364	422	454	565	643	387	336	512	646	673
<i>Whole Province—</i>																	
Salmon cannery....	82	65	56	65	61	62	67	79	76	76	71	54	35	44	49	49	43
Salmon purse-seine	138	155	59	147	223	242	329	445	552	397	371	243	228	157	256	296	295
Salmon drag-seine.	104	45	35	40	31	32	37	41	46	22	22	21	21	30	31	9	9
Salmon gill-net....	4,598	4,761	4,777	4,483	3,969	3,696	4,226	4,850	5,643	5,179	5,609	6,061	4,893	5,359	6,113	6,826	6,216

NOTE.—During the season 1928 F. Miller's cannery at Vancouver, the Cassiar Cannery on the Skeena and the Massett Cannery, Massett Inlet, operated without licences, and are not included in the number of cannery licences shown above.



## STATEMENT No. 14

STATEMENT OF POWER BOATS OPERATED IN DISTRICT No. 2, BRITISH COLUMBIA,  
IN CONNECTION WITH SALMON GILLNET OPERATIONS

	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
Naas river.....	3	9	35	21	37	34	119	142	179	233	268	243
Skeena river.....	18	64	133	162	216	263	472	603	660	668	732	804
Bella Coola and Kimsquit.....	1	12	49	47	90\103	70	124	94	89	101	156	150
Central area.....		8	28	87	13	73		68	111	165	234	161
Rivers inlet.....	54	110	254	248	479	435	712	682	776	901	1,233	1,164
Smiths inlet.....	9	39	131	110	204	135	231	176	175	219	299	285
Queen Charlotte Islands.....					10							
	85	242	630	675	1,049	1,010	1,658	1,765	1,990	2,287	2,922	2,807

## STATEMENT No. 15

## PACK OF SOCKEYE SALMON FROM RUNS TO FRASER RIVER, 1925-1935

Year	Fraser river canneries	Canadian traps in Juan de Fuca Straits	Puget Sound (U.S.A.) canneries	Total Cases
1925.....	31,523	3,862	106,064	141,449
1926.....	83,589	2,091	44,569	130,249
1927.....	57,085	4,337	96,343	157,765
1928.....	26,530	2,769	61,044	90,343
1929.....	60,407	3,480	111,856	175,743
1930.....	93,416*	5,334	352,194	450,944
1931.....	38,507*	2,440	83,728	124,675
1932.....	61,769*	4,000	78,319	144,088
1933.....	43,745*	8,721	125,738	178,204
1934.....	133,159*	6,117	352,579	491,855
1935.....	57,212*	5,610	54,677	117,499

\*Does not include sockeye canned on Fraser and caught in other districts.

NOTE.—1934 pack at Fraser river canneries includes 5,643 cases sockeye caught on Fraser river and canned in other districts. A statement showing the yearly figures from 1876 to 1930 will be found in the departmental report for 1930-31.

STATEMENT No. 16  
NUMBER OF FISHERY LICENCES ISSUED, BRITISH COLUMBIA, SEASON 1935

Variety of Licence	Issued				Transfers				Operating				Total No.			
	White	Ind.	Others	Jap R.S.	Can- celled	Total No.	White	Ind.	Jap R.S.	Total No.	White	Ind.		Others	Jap R.S.	Can- celled
Salmon trap-net.....	8	9				8					8					8
Salmon drag-seine.....	220	72			1	293					220					9
Salmon purse-seine.....	2,828	1,101	911	41	82	4,963	993	242	18	1,253	3,843		911	59	1	293
Salmon gill-net.....	2,170	590	155	5	13	2,933	64	5		69	2,234		1,595	155	82	6,216
Salmon trolling.....	138	301	514			953					138		301	514	13	3,002
Asst. salmon gill-net.....		93				167					74		93			953
Capt. salmon seine.....	1,011	661				1,672					1,011		661			1,672
Asst. salmon seine.....	222	47	147	2	10	428					222		47	147	2	10
Cod.....	87	26				113					87		26			113
Crab.....	23	1	88			112					23		1			112
Grayfish.....	29	1	14	3		48					29		14		3	48
Small inshore dragger.....	18		9	1	1	29					18		9		1	29
Miscellaneous fishery.....	69	10	27	7	4	117	1			1	70		10	27	7	118
Herring pound.....	8					8					8					8
Herring purse-seine.....	28		2			30					28		2			30
Herring gill-net.....	17		4		1	22	4				17		4		1	22
Capt. herring seine.....	11	2	4			17	11				11		4			17
Asst. herring seine.....	155	50	89			294	29				155		50	89		294
Pilchard purse-seine.....	21					21					21					21
Capt. pilchard seine.....	20	1				21					20		1			21
Asst. pilchard seine.....	171	6				177					171		6			177
Capt. hal. boat for bait.....	3					3					3					3
Totals.....	7,331	2,971	1,964	59	113	12,438	1,058	247	18	1,323	8,359	3,218	1,964	77	113	13,761

Indian permits, 2,029.

Angling permits, 715.

LICENCES ISSUED BY PROVINCIAL GOVERNMENT

Salmon cannery.....	43
Pilchard cannery.....	2
Pilchard reduction.....	7
Salmon dry saltery.....	31
Herring dry saltery.....	21

## STATEMENT No. 17

STATEMENT OF NUMBERS OF DIFFERENT SPECIES OF SALMON AND METHOD OF CAPTURE, REPORTED BY OPERATORS OF SALMON PURSE-SEINES, DRAG-SEINES, AND TRAP-NETS, AND BY SALMON CANNING, CURING, AND COLD STORAGE ESTABLISHMENTS, OF GILL-NET AND TROLL CAUGHT FISH, BRITISH COLUMBIA—1935

—	Sockeye	Spring	Blue-back	Steel-head	Coho	Pink	Chum	Total No.
Troll.....		1,048,667	169,447	2,800	1,627,741	356	505	2,849,525
Gill-net.....	3,901,561	245,332	5	40,381	931,898	2,632,828	1,696,364	9,448,369
Purse-seine.....	600,534	27,555	3,046	1,715	483,833	4,348,131	3,312,394	8,777,208
Drag-seine.....	31,503			2	4,930	25,678	1,797	63,910
Trap-net.....	73,103	19,810	141	958	50,117	397,595	4,563	546,287
Totals.....	4,606,701	1,341,364	172,639	45,865	3,098,519	7,404,588	5,015,623	21,685,299

## STATEMENT No. 18

STATEMENT OF NUMBER OF SALMON CAUGHT BY PURSE-SEINES, SHOWN BY SEINING AREAS, SEASON 1935

Area	Sockeye	Spring	Blue-back	Steel-head	Coho	Pink	Chum	Total No.
1.....								
2.....					20,612	45,705	851,761	918,078
3.....	22,760	970		210	3,983	256,434	58,640	342,997
4.....						447	3,979	4,426
5.....	28,815	368		18	40,396	141,508	55,617	266,722
6.....	35,449	1,314		135	34,014	324,250	207,380	602,542
7.....	24,403	577		119	25,037	380,510	275,182	705,828
8.....	1,332	23		79	2,508	139,909	33,678	177,529
9.....					17	652	6,512	7,181
10.....	75	2			5,270	39,912	71,637	116,896
11.....	3			1	5,544	138	37,277	42,963
12.....	214,291	5,588	1,410	849	74,693	1,180,355	239,126	1,716,312
13.....	22,376	1,521	1,626	76	41,925	509,401	289,592	866,517
14.....		133			8,337	18,498	156,367	183,335
15.....	1	7			270		5,471	5,749
16.....	40	8			3,143	102,876	43,639	149,706
17.....								
18.....	156,816	14,745	10	19	140,456	1,178,440	48,247	1,538,733
19.....								
20.....					311		4	315
21.....	2,455	349		3	28,487	10,558	91,627	133,479
22.....					3,990	14,514	202,285	220,789
23.....	15,367	1,950		205	6,023	4,019	199,063	226,627
24.....	67,829			1	5,291	5	105,561	178,687
25.....	3,130				6,267		182,878	192,275
26.....	2,000				6,399		51,470	59,869
27.....	3,392				20,860		95,401	119,653
Totals.....	600,534	27,555	3,046	1,715	483,833	4,348,131	3,312,394	8,777,208



## DEPARTMENT OF FISHERIES

## STATEMENT No. 19

STATEMENT SHOWING PACKS OF CANNED SALMON, 1932-1935, WITH QUANTITIES  
GRADED SECOND QUALITY AND PERCENTAGES

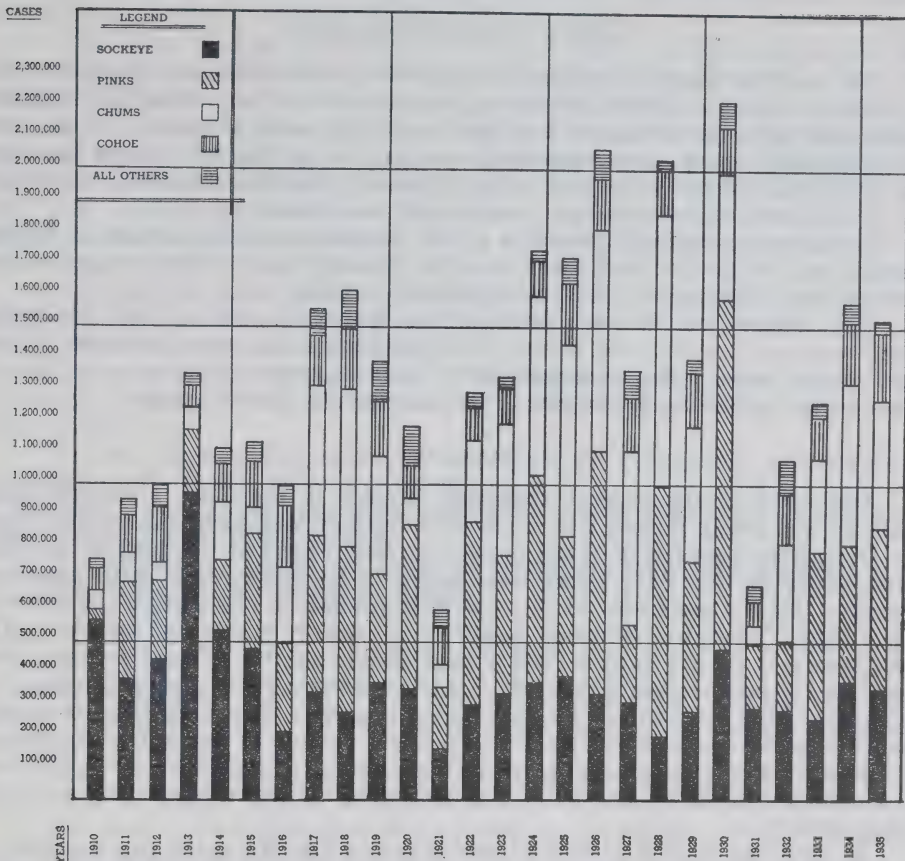
—	Sockeye	Spring	Steel- head	Blue- back	Cohoe	Pink	Chum	Total
1932 Pack, cases.....	284,355	76,060	1,168	28,505	160,466	223,716	306,761	1,081,031
Grade B, cases.....	3,355	1,234	.....	164	333	119	3,083	8,288
Per cent of Total.....	1.179	1.622	.....	.575	.207	.053	1.005	.766
1933 Pack, cases.....	258,107	20,266	1,459	21,763	137,289	532,558	293,630	1,265,072
Grade B, cases.....	494	.....	.....	10	873	15,149	887	17,413
Per cent of Total.....	.191	.....	.....	.045	.635	2.844	.302	1.376
1934 Pack, cases.....	377,882	29,784	1,282	29,556	195,874	435,364	513,184	1,582,926
Grade B, cases.....	21,620	139	5	.....	962	4,085	1,127	27,938
Per cent of Total.....	5.721	.466	.390	.....	.491	.938	.219	1.764
1935 Pack, cases.....	350,444	21,920	596	15,319	216,173	514,966	409,604	1,529,022
Grade B, cases.....	3,487	501	.....	.....	5,341	18,420	9,876	37,625
Per cent of Total.....	.995	2.280	.....	.....	2.470	3.576	2.419	2.460

RE-CAPITULATION SHOWING FOUR YEARS TOTALS AND PERCENTAGES GRADED SECOND QUALITY OR  
GRADE B

Total Packs, cases.....	1,270,788	148,030	4,505	95,143	709,802	1,706,604	1,523,179	5,458,051
Total Grade B, cases....	28,956	1,874	5	174	7,509	37,773	14,973	91,264
Percent of Total.....	2.278	1.265	.110	.182	1.057	2.213	.983	1.672

## BRITISH COLUMBIA

Graph showing total pack of canned salmon, by species, 1910 to 1935 inclusive



KEY TO GRAPH SHOWING TOTAL BRITISH COLUMBIA PACKS OF CANNED SALMON, BY SPECIES, 1910 to 1935 INCLUSIVE

Vertical scale is divided into large divisions of 500,000 cases, each of which is sub-divided into 10 smaller squares of 50,000 cases, which are in turn sub-divided into five lines of 10,000 cases each. Sockeye pack exactly as represented on graph; Pink totals added to Sockeye reach points indicated, other species increasing the length of each year's pole. Total pack of each year is therefore shown by each pole to the nearest ten thousand. The following scale shows the additions of species and denotes points plotted on graph. Figures are taken from official tables in printed annual reports.

Year	Sockeye	plus	Pinks	Total	plus	Chums	Total	plus	Cohoe	Total	plus	All Others equal	Total Packs
1910	565,915	"	34,613	600,528	"	58,362	658,890	"	74,382	733,272	"	28,929	762,201
1911	383,509	"	305,247	688,756	"	91,951	780,707	"	119,802	900,509	"	48,456	948,965
1912	444,762	"	247,743	692,505	"	58,325	750,830	"	165,309	916,139	"	80,437	996,576
1913	972,178	"	192,887	1,165,065	"	77,965	1,243,030	"	69,822	1,312,852	"	41,049	1,353,901
1914	536,696	"	220,340	757,036	"	184,474	941,510	"	120,201	1,061,711	"	49,328	1,111,039
1915	476,042	"	367,352	843,394	"	82,000	925,394	"	146,956	1,072,350	"	61,031	1,133,381
1916	214,789	"	280,644	495,433	"	240,201	735,634	"	183,623	919,257	"	75,808	995,065
1917	339,848	"	496,759	836,607	"	475,273	1,311,880	"	157,599	1,469,469	"	88,016	1,557,485
1918	276,459	"	527,745	804,204	"	497,615	1,301,819	"	191,068	1,492,887	"	123,270	1,616,157
1919	369,445	"	346,639	716,084	"	372,035	1,088,119	"	175,670	1,263,789	"	129,367	1,393,156
1920	351,405	"	520,856	872,261	"	84,626	956,887	"	101,972	1,058,859	"	128,757	1,187,616
1921	163,914	"	192,906	356,820	"	71,408	428,228	"	117,288	545,516	"	58,032	603,548
1922	299,614	"	581,979	881,593	"	258,204	1,139,797	"	102,845	1,242,642	"	47,684	1,290,326
1923	334,647	"	440,932	775,579	"	418,055	1,193,634	"	112,044	1,305,678	"	35,999	1,341,677
1924	369,601	"	657,561 *	1,027,162	"	570,497	1,597,659	"	115,944	1,713,603	"	33,902	1,747,505
1925	392,643	"	445,400	838,043	"	607,904	1,445,947	"	188,505	1,634,452	"	86,170	1,720,622
1926	336,995	"	772,993	1,109,988	"	701,962	1,811,950	"	162,449	1,974,399	"	90,799	2,065,198
1927	308,032	"	247,617	555,649	"	562,109	1,117,758	"	161,148	1,278,906	"	81,543	1,360,449
1928	203,541	"	792,362	995,903	"	863,256	1,859,159	"	150,684	2,009,843	"	25,794	2,035,637
1929	281,306	"	477,969	759,275	"	424,982	1,184,257	"	174,198	1,358,455	"	42,295	1,400,750
1930	477,678	"	1,111,937	1,589,615	"	401,114	1,990,729	"	148,561	2,139,290	"	82,493	2,221,783
1931	291,464	"	206,995	498,459	"	55,997	554,456	"	76,879	631,335	"	53,769	685,104
1932	284,355	"	223,718	508,071	"	306,761	814,832	"	160,466	975,298	"	105,733	1,081,031
1933	258,107	"	532,558	790,665	"	293,630	1,084,295	"	137,289	1,221,584	"	43,488	1,265,072
1934	377,882	"	435,864	813,746	"	513,184	1,326,930	"	195,874	1,522,804	"	60,622	1,583,426
1935	350,444	"	514,966	865,410	"	409,604	1,275,014	"	216,173	1,491,187	"	37,835	1,529,022

## REPORT ON INSPECTION OF SPAWNING GROUNDS, 1935

## QUEEN CHARLOTTE ISLANDS

The sockeye runs to the Queen Charlottes are not materially important but in 1935 the supplies on the spawning grounds of the Ian, Awan and Yakoun rivers and the river at Copper bay were much the same as usual. In the case of springs and cohoes, the escapement was an average one but as this has been an "off" year for the pinks only a few of that species were observed, apart from the Tl-ell river, where a medium escapement was found.

In the case of chums, there was a fair escapement to the streams in Naden harbour and to the Ian and Awan rivers in Massett inlet. The streams on the west coast of Graham island were only lightly seeded.

The streams on the east coast of the Queen Charlottes from Skidegate south were well seeded with chums, notwithstanding that over 1,000,000 fish of this variety were taken commercially. The conservation measures of recent years in the northern area appear to be bringing the desired results.

## NAAS AREA

Inspection of the sockeye spawning grounds in the Naas area was again made by Mr. Frank Warne, who reached the head of Meziaden lake on September 8. During the next few days the beaches on both shores at the head of the lake, down as far as Five Mile point, were found to be well covered with spawning sockeye. On the remainder of the spawning grounds in this section the run was fairly light. There was evidence, however, of a goodly number of sockeye in the lake, spawning off the beaches, and a considerable number of dead sockeye were found on the beaches and in the lake. At the fishway at the foot of the lake, on September 12, a good run of sockeye was in progress. Fresh supplies, in goodly numbers, were observed coming in at the lower falls each day up to September 22 and a fresh run was also observed on the morning of the 25th. As in the case of the early run mentioned above, the fish were mostly of large size, no runts being observed.

In summing up, the inspecting officer states that the early run was heavy, similar to the seeding of 1930, and much better than the seeding reported in 1931. The late run was good but not as heavy as the run reported in 1930, although much heavier than the run of 1931.

The spring salmon supply found in Meziaden district is reported as heavy and far better than that of the previous year.

The fishway at the outlet of the lake was found to be in good condition.

An examination by the local inspector of the lower reaches of the Naas area shows a good run of sockeye to the Tseaz and Gingit rivers, as compared with other seasons.

The escapement of pinks was not so satisfactory as might be desired and undoubtedly some further action will be required to see that this run is safeguarded.

The supply of coho found on the spawning grounds was only fairly satisfactory. The chum seeding was quite adequate.

## SKEENA RIVER

Notwithstanding the poor sockeye pack in this area, the escapement was found to be fairly heavy. It was nearly as good as in the case of the large run of 1930, and much better than that of 1931. This applies to practically the whole watershed and no doubt was the result partly at any rate of deferring the opening date of sockeye fishing from June 20 to July 1.



In the Babine Lake area, the showing was very satisfactory; for instance, at Fifteen Mile creek there was an extra heavy run. This comment also applies to Pierre creek and, in a lesser degree, to Fulton river.

In the upper Babine river there was a large supply of big sockeye and that area received a heavy seeding. This condition also obtained largely in the lower part of the Babine and the seeding was undoubtedly good.

In the Lakelse district, an excellent supply was found and, in addition to the hatchery being filled, a large natural seeding occurred. Unfortunately, however, freshets practically destroyed all the eggs naturally deposited and had not hatchery operations at this point permitted of the seeding of the streams after the freshets, the run, as far as the seeding was concerned, would have been an entire loss.

In the Morice Lake district, spawning conditions were found very favourable. On the Nanika river, more sockeye were observed than the inspecting officer had previously encountered.

The supply of springs was found to be unusually light and steps are being taken, by means of lowering the boundary on the Skeena river, to take care of this variety.

The coho supply was found to be reasonably satisfactory and compared favourably with that in other good years.

There was a heavy escapement of pinks to the spawning grounds and a good supply should result in 1937.

The spawning of chums was found to be normal, although the Skeena is not a large producer of this species of salmon.

#### LOWE INLET

The escapement of sockeye was reasonably satisfactory and similar to that of the brood year of 1931. This is not a spring salmon area but the escapement of cohoes was fair.

There was a general improvement in the supply of pinks over that of the brood year of 1933.

This area is not a big factor in the production of chums, but the escapement to the spawning grounds was normal.

#### BUTEDALE AREA

Butedale area is not a good sockeye district but the escapement in 1935 was normal.

The run of springs is usually light here but the supply found this year was even smaller than usual and in the case of cohoes the escapement was only fair.

The pink escapement was not satisfactory as far as the small streams were concerned, owing to the lack of water, but the larger streams fared better.

The supply of chums was found to be satisfactory.

#### BELLA BELLA AREA

The sockeye in the Bella Bella district are of the creek variety. The 1935 escapement was heavy, notwithstanding small commercial catches.

This is not a spring area. The escapement of cohoes, however, was quite satisfactory.

The supply of pinks was excellent and the escapement to the spawning beds is reported much heavier than during the brood year of 1933. This was no doubt due to the special conservation measures taken this year by the department.

Although the run of chums to the area was good, the escapement was not as satisfactory as could be desired.

## BELLA COOLA AREA

The escapement of sockeye in the Bella Coola area shows an increase over that of the brood year of 1931, and may be considered as good. No doubt this is partly due to the deferring of the opening date of fishing to July 1, which permitted a larger early escapement and also resulted in a greater portion of the run which passed through Fitzhugh sound and Fisher channel reaching the Bella Coola district.

The usual small run of springs was present and was not fished in this area.

The coho escapement was quite heavy and the quantity of pinks found on the spawning grounds was excellent.

The chum supply found on the spawning grounds is reported as heavy and better than that of the last five or six years.

## RIVERS INLET AREA

The sockeye supply was found to be greater in the Rivers Inlet area this year than for some time past. Notwithstanding an unusually large commercial catch, the spawning grounds were unusually well supplied. The escapement to Rivers Inlet area generally can be considered as unusually large.

There is not a large run of pink salmon to the area but the supply on the spawning grounds was found to be a little less than normal.

The coho supply, although never heavy, was only slightly better than usual.

This district is not an important pink area but the supply of this variety was normal.

The chum escapement to such areas as Draney's inlet and Moses inlet was good.

## SMITHS INLET AREA

There was a good escapement of sockeye to the spawning grounds of the Smiths Inlet area and the main streams frequented by these fish were found to be crowded with spawning salmon. There appears to be no doubt as to the present regulations being adequate for the purpose of taking care of this valuable run.

The spring supply is not fished commercially in the district but the escapement in 1935 was found to be fairly light. The variety is not that most desired, being the large, coarse, white variety.

The pink run which proceeds to the Nekite river, situated at the head of the inlet, showed a fairly heavy escapement to the spawning grounds. The supply at this point seems to be increasing.

The chum supply was found to be quite satisfactory.

## FRASER RIVER WATERSHED

It was not expected there would be any material quantity of sockeye salmon reaching the upper reaches of the Fraser River watershed during the year since the brood year showed very few fish. The inspection this season confirmed these expectations.

In the Chilco Lake area, the sockeye supply was equal to that of the brood year of 1931 and is quite satisfactory.

It is to the Shuswap system that the late run of sockeye proceeds. This year it was feared at one time that this late run had not arrived as it did not make the sudden rush for the river which had been usual during the last three cycle years. Undoubtedly the run did arrive, however, but passed up the Fraser gradually and largely during the special week's closure. The fish were found on the spawning grounds in considerable numbers—although possibly not



in numbers equalling those of the brood year of 1931, yet very nearly so. The particular streams used by this run are the Adams and Little rivers. Only an odd sockeye was observed in Eagle river, at the head of the Shuswap system, and none were seen in Scotch creek, Granite creek, or the streams at the head of Seymour and Anistee arms of Shuswap lake.

The Cultus Lake run was about what was expected and can be considered as reasonably satisfactory.

The supply of sockeye reaching the Birkenhead system was most gratifying, the best for a number of years. These conditions also obtained in the Pitt River system, where the run was the largest in the experience of the hatchery staff.

Spring salmon spawning compared very favourably with that of recent years. Increased numbers were found in the Thompson and Quesnel rivers. The coho supply, as well as the supply of chums, was quite satisfactory and compared favourably with that of recent cycles.

This was a big pink year on the lower mainland streams and the run was no disappointment. In the tributaries usually frequented by these salmon, there were found ample supplies for a good seeding. In the streams at the head of Burrard inlet and Howe sound, unusually large quantities were found.

Extra closed season resulted in an excellent escapement of chums to the Fraser system generally and the seeding of the spawning beds with this variety was satisfactory.

#### ALERT BAY AREA

The run of sockeye to the Nimpkish river was the heaviest since 1927 and the escapement better than for a considerable number of years. The improvement over the brood year of 1931 was quite marked and the spawning this year was unusually good.

In McKenzie sound there was an increase over the numbers of the brood year and the seeding was quite satisfactory.

At Keough river, Knight inlet, an improvement was shown over the brood year and the Port Neville seeding was normal.

The runs of the creek variety to the Shushartie and Nahwittie rivers were a decided improvement over those of 1931. These runs, however, are very rarely fished.

The supply of springs was satisfactory, the coho supply better than normal, and the pink seeding exceeded that of 1933 by approximately 25 per cent.

#### QUATHIASKI AREA

At Hayden Bay creek, the run appears to be improving as the supply of sockeye this year was found to be unusually large as compared with those of the last five years. The seeding of the spawning grounds at the head of Phillips arm was also more satisfactory than in the brood year.

The spring supply at Campbell river was not so good as in the year previous but, nevertheless, was about normal. An improvement was observed at Salmon river, at Phillips river the supply was about average, and to the rivers at the head of Bute inlet the run heavier than usual.

All streams were well seeded with cohoes, with the exception of Campbell river, where at the time of inspection the numbers were not found up to normal although the run was continuing.

This being an "off" year for pinks in the district, few were expected but the spawning was average for an "off" year.

All streams were well supplied with chums.



## COMOX AREA

The Comox region is not a sockeye area but in 1935 springs were observed in greater numbers than in most recent years. The supply of cohoes and pinks was quite satisfactory.

In the case of chums, the numbers found were smaller than in the year previous, save at Puntledge river, where the number observed was greater than for many years past. These conditions also existed at the Oyster river. The chum seeding generally was quite satisfactory.

## PENDER HARBOUR AREA

Saginaw creek contains the only run of sockeye in the Pender Harbour area and the seeding was better in 1935 than in the brood year.

In the case of cohoes, the supply was the best observed in the last eight years at Toba inlet and the seeding of the Toba and Brem rivers was quite adequate. Throughout the rest of the district, conditions were reasonably good.

The pink supply was unusually good and the number found on the spawning grounds was the largest for many years. This comment applies particularly to Jarvis inlet, where the large portion of the run occurs, and at Mission creek, near Sechelt.

## NANAIMO AREA

The coho supply in all streams between Arbutus point and Nanaimo showed an increase of approximately 25 per cent over that of the previous year and there would appear to be reason to believe that the coho supply in these streams is on the increase.

The chum seeding in this area was the best in recent years and was very gratifying.

## LADYSMITH AREA

The supply of springs was an average one in the Ladysmith area and the coho supply was satisfactory. In the Chemainus and Nanaimo rivers, pinks were observed in small quantities but, of course, this was an "off" year for that variety in the district.

The seeding of chums in the Chemainus River area was much heavier than for several years. The Nanaimo river also had a good average spawning. This was the case also in the smaller streams in the district.

## COWICHAN AREA

In the Cowichan area the spawning of spring salmon was not very satisfactory and hardly up to the average, particularly in the Cowichan and Koksilah rivers.

In the case of cohoes, however, quite a satisfactory run passed to the spawning grounds.

The chum supplies showed an increase over recent years and the run was one of the heaviest experienced. The steelhead supply compared very favourably with that of previous years.

## VICTORIA AREA

The spawning of coho was, generally speaking, an average one in the Victoria area, apart from Goldstream, where the quantity observed was smaller than usual. In the case of chums, however, Goldstream showed more satisfactory quantities. In the streams along the west coast of the area, on the other hand, the supplies of chums were not as satisfactory as usual.

## ALBERNI AREA

The sockeye escapement to the spawning areas of Sproat lake, Great Central lake, and Anderson lake was one of the best experienced, notwithstanding the very satisfactory commercial catch. The spawning of sockeye in the Nitinat Arm area was also quite satisfactory.

In the case of cohoes, all the main rivers in the Barclay Sound section were heavily seeded. This was true also in the Port Renfrew and Nitinat portions of the district.

The spring escapement was a good average one and compared very favourably with those of recent years.

The chum escapement to the Nitinat area was quite satisfactory, as happened also at Port Renfrew. In the case of Barclay sound, the run was not so large as expected but the escapement to the spawning grounds was excellent.

## CLAYOQUOT SOUND AREA

The sockeye found in the Kennedy Lake and Medgin Lake spawning district were unusually large.

The spring escapement was a good one and the coho and chum supplies were eminently satisfactory.

## NOOTKA SOUND AREA

Sockeye are not a large factor in the fishing in the Nootka Sound area but the parent fish on the spawning beds were found to be in average numbers in 1935. Springs and cohoes were present in the usual quantities but few pinks were observed, as they do not frequent the Nootka district to any extent.

Chum supply was not up to expectations. The percentage of escapement from commercial fishing, however, was better than usual and the seeding may be regarded as reasonably satisfactory.

## KYUQUOT SOUND AREA

The small sockeye supplies found on the spawning grounds of the Kyuquot Sound area would appear to justify the conclusion that this run is being maintained, although it is never a large one.

In the case of springs, cohoes, and chums, the 1935 escapement cannot be considered as satisfactory.

## QUATSINO SOUND AREA

The usual small sockeye supply was present in the Quatsino Sound territory although this is not a material factor in the fishing operations of the area.

The spring seeding of 1935 can be considered only a bare average. The cohoes on the spawning grounds of the Rupert Arm district, however, were in very satisfactory numbers and in average numbers in the rest of the area. The chum supply was heavy, excepting at Winter harbour.

## APPENDIX No. 2

SUMMARY REPORT OF THE WORK OF THE BIOLOGICAL BOARD  
OF CANADA FOR THE YEAR 1935

BY THE CHAIRMAN, A. T. CAMERON, WINNIPEG

It is my sad duty to chronicle in this report the death on October 19, 1935, of Dr. Archibald Patterson Knight, formerly Professor of Physiology and Animal Biology at Queen's University. Dr. Knight was a member of the Executive Committee of the board from its original formation in 1898, and acted as Chairman during the period 1920-25. The executive has minuted the following appreciation of his work, which was prepared by Dr. J. P. McMurich: "His earliest researches in connection with the work of the board were on the pollution of waters by sawdust and other substances injurious to fish life. These were followed by an experimental study of the efficiency of various baits. Later he took up the problems of lobster hatching and lobster canning, revealing the futility of the methods of lobster hatching then in vogue and saving the expenditure of thousands of dollars by advising the abolition of the lobster hatcheries then in operation. The canneries, too, many of which he visited, profited greatly from his insistence on cleanliness and proper sterilization technique. Latterly he had become interested in fish culture in general and especially in that of the brook trout, these studies again leading to an advocacy of improvements in technique. Dr. Knight was a clear thinker, clear and concise both in speech and writing, a close observer, and a consistent and vigorous advocate of all measures looking to the improvement of our fisheries. His interest in the fisheries was deep and lasted long after his retirement, indeed, practically until his death in his eighty-sixth year."

During the past year two members of the board, our youngest, and our oldest, have resigned—Professor A. F. Chaisson, who is transferring his activities to the sphere of medical practice, and Professor Philip Cox, who, at the age of 84, finds that his health compels him to relinquish his active interest and participation in the board's work after an association lasting nearly forty years.

It is my pleasurable duty to record the continued close co-operation between the board and the department, the faithful attendance of the board's Executive and Sub-Executives to their duties, which, though honorary, involve much work and thought on each member, and the whole-hearted and loyal co-operation of the board's officers. I would wish also to pay my personal tribute to the wise guidance we continue to receive from Mr. J. J. Cowie, the honorary Secretary-Treasurer, who, as Director of Fisheries in the Department, is able to give us facilities for the greatly increased executive duties which modern developments have automatically made a part of our work.

The following is the list of stations and sub-stations at present operated by the board:—

## ATLANTIC COAST

*St. Andrews, N.B. Atlantic Biological Station.*—Field work on sea-fishery and fish-cultural problems is carried out at many points in New Brunswick and Nova Scotia, and is controlled from this Station.

*Ellerslie, P.E.I. Biological Sub-station.*—Associated with the St. Andrews Station, and concerned especially with oyster culture.



*Halifax, N.S. Atlantic Fisheries Experimental Station.*—Concerned with the handling and preservation of fish for food and the development of fish products other than food. (With this Station is associated the Eastern Passage Laboratory).

## PACIFIC COAST

*Departure Bay, B.C. Pacific Biological Station.*—Field work directed from this Station is carried out at numerous places in British Columbia and the adjacent waters.

*Cultus Lake, B.C. Biological Sub-station.*—Under direction of the Departure Bay Station, and immediately concerned with study of the propagation of sockeye salmon.

*McClinton Creek, Queen Charlotte Is., B.C. Biological Sub-station.*—Under direction of the Departure Bay Station, and immediately concerned with study of the propagation of "pink" salmon.

*Prince Rupert, B.C. Pacific Fisheries Experimental Station.*—Concerned with the handling and preservation of fish for food and the development of fish-products other than food.

It should perhaps be stressed that in many respects these Stations should be considered as constituted by the group of scientists connected with them, rather than by a group of buildings. Some problems can be brought to the buildings for study, but the majority also require an attack in the field. When such attack needs prolonged work a sub-station is established.

For the work of the current year the sum of \$186,000 was voted, and this has been allotted as follows:—

St. Andrews Station and work associated therewith.. . . .	\$ 43,730
Halifax Station and work associated therewith.. . . .	39,300
Nanaimo Station and work associated therewith.. . . .	48,610
Prince Rupert Station and work associated therewith.. . . .	30,750
General Account (including the Margaree investigation, and editorial and printing expenses).. . . .	23,610

In my last report I stressed the cold fact that research costs money, and the larger the amount of money available for particular research problems, the greater is the chance of their solution, and of more rapid solution. For a number of years the board has been faced with the problem of having greater demands made upon it by the department and the industry than the monies provided were adequate to meet, so that selection of work became essential, while more recently even greater selection has seemed necessary to permit greater concentration on individual problems and their more rapid solution.

While endeavouring to carry to completion the various pieces of work already in progress, at the present time our directors are canvassing the whole range of problems which may legitimately come within our duties, eliciting information from both departmental officials and from the industry, and we hope that we will thereby be able to take a more far-sighted view than was hitherto possible, and to plan our work ahead for a period of several years.

The problems of the board concern the conservation, development, and administration of the fisheries. They are in part biological, concerned with the maintenance and increased production of stocks, and in part technical, concerned with the efficient processing of the catch and marketing of the product. In my report for 1934 I outlined some of the successful work that the board has achieved in the past few years. In this I wish to draw attention to some of the major accomplishments during 1935.

## RESULTS FROM THE BIOLOGICAL STATIONS

The hydrography of the waters off the Nova Scotian coast, that is, the study of their temperatures, salinities, and movements, has been continued and extended to a larger area, and over a longer period of the year. This study has shown a marked contrast in the conditions existing in 1934 and 1935. In the latter year much colder water prevailed generally. The movements of both cod and haddock were thereby affected in a manner which could be deduced from previous studies. As examples are the fact that the spring run of cod remained further off-shore, while abnormally large catches of haddock resulted from their concentration in shallow in-shore areas. This year's results lend further support to the conclusion that a knowledge of hydrographic conditions will be of great value in controlling the catch of fish.

Studies have been continued bearing on the conservation of the lobster, and particularly in connection with its early growth. These will be of importance in evaluating the success of reproduction under natural conditions, and, in conjunction with previous work, will afford an essential and valuable basis for that detailed study of the lobster problem which the board hopes to carry out in the near future when funds are made available.

A small scale experiment at the St. Andrews Station on the rearing of trout fry in artificially fertilized water has given considerable promise of success for this type of operation. Considerable assistance has been rendered to the Fish Culture Branch both in connection with the rearing of fish at hatcheries and with the experimental improvement of lake conditions.

Coming now to western work, during 1935 the first stage of the experiment on cultivation of sockeye salmon at Cultus lake has been brought to completion, and the conclusion has been drawn that—with regard to this species—hatchery propagation is no more successful than natural propagation. In each case the loss during the early life-stages passed in fresh water is relatively enormous, due, apparently, to predaceous fish. It is hoped to prepare and publish in the very near future a bulletin dealing with the results of this very important 10-year experiment. The second stage has been started during the year, and consists of an endeavour to ascertain the effect on young salmon conservation of lessening the number of predaceous fish in this area.

By arrangement with the Fish Culture Branch the Western Biological Station has taken over the direction of the Cowichan Lake Hatchery for trout and spring salmon. The experimental program for study of hatchery conditions and methods, if adequate financial provision can be made for it, will, it is hoped, throw considerable light on hatchery practice in connection with sporting fishes, and may lead to valuable improvements.

In order to assist the development of fish cultural management policies for certain areas in British Columbia and the Dominion Parks, surveys have been carried out, and specific recommendations are being prepared concerning the Cowichan River system, the Serpentine and Nicomekl rivers, lake Okanagan, the lakes in Jasper Park, and Clear lake in Riding Mountain Park.

The first phase of the herring investigation has been completed, and evidence has been obtained of distinct populations in different areas in British Columbian waters; it has been shown that the yearly fluctuations in total population are related to predominance of fish spawned in particular years, and this obviously has an important bearing on the catch.

## THE MARGAREE INVESTIGATION

Investigation of this important river in Cape Breton Island indicates that the poor angling in the last two years is due more to reduced river discharge than to such factors as poaching or excessive commercial netting. This conclusion suggests that correction of such a condition of poor angling must be through control of discharge, and it is hoped to test the truth of this theory experimentally.



## RESULTS FROM THE EXPERIMENTAL STATIONS

At Halifax an investigation is being carried on designed to increase the per capita consumption of fish in Canada, and especially of fresh and refrigerated fish, by an examination of fish as it actually reaches the public for consumption, and the rôle that its previous history plays in its actual state at this stage. A method has been established as a criterion of the freshness of fish, based upon the evolution of volatile gases from the flesh.

This method is being applied to a study of the changing conditions of the fish which may occur during present practices in catching and stowing in transit to port, and of shore practices involved in transportation, storing and retailing, and permits an accurate scientific study of the whole problem.

At Prince Rupert the vitamin survey of body and liver oils of Pacific Coast fishes has been considerably extended. In particular, the survey has covered the seasonal and yearly variations of vitamin D in pilchard oil, and the study of liver oils of such fishes as the halibut, cod, and skate, which are high in vitamin A content. Some attention has been paid to a comparison of vitamin A values in pilchard oils, as determined by chemical, physical, and biological procedures, with a view to obtaining a commercial oil of more uniform vitamin content, for medicinal and stock-feeding purposes. The station has participated in successful clinical studies designed to test the values of various blended oils.

The preservation of frozen fish has been improved through the development of a new type of ice-glaze which incorporates a harmless substance with mildly antiseptic properties, and which produces a flexible glaze that does not crack easily, thus affording a marketable product of pleasing appearance. The production of this glaze is a good illustration of the application of purely physical researches on the properties of ices formed from dilute solutions.

Methods already developed at this station for the better protection and carriage of fresh fish in transit to port are being used on both coasts, to a steadily if slowly increasing extent.



# APPENDIX No. 3

## FISH CULTURE

### ANNUAL REPORT BY J. A. RODD, DIRECTOR

Fish cultural operations of the Department of Fisheries are confined to those provinces in which it administers the fisheries in whole or in part, that is, Nova Scotia, New Brunswick, Prince Edward Island and British Columbia. The hatcheries located in the National Parks, Alberta, are also directed by the Department of Fisheries but at the expense of the National Parks branch, Department of the Interior.

The total distribution from the hatcheries operated by this department in 1935 was 145,878,304. The numbers of each species distributed were:—

STATEMENT BY SPECIES OF THE FISH AND FISH EGGS DISTRIBUTED FROM THE HATCHERIES DURING THE YEAR ENDED DECEMBER 31, 1935

Species	Green eggs	Eyed eggs	Fry	Advanced fry	Fingerlings	
					No. 1	No. 2
<i>Salmo salar</i> —Atlantic salmon.....	10,850	18,450	1,835,614	3,788,735	9,199,816	2,514,504
<i>Salmo salar sebago</i> —Landlocked salmon.....					71,772	16,775
<i>Salmo irideus</i> —Rainbow trout.....		116,034	75,000	312,272	761,429	63,178
<i>Salmo clarkii</i> —Cutthroat trout.....		105,000	49,401	36,000	1,601,590	
<i>Salmo rivularis</i> —Steelhead salmon.....					36,500	61,289
<i>Salmo rivularis kamloops</i> —Kamloops trout.....		3,157,616	2,935,895			
<i>Salmo levenensis</i> —Loch Leven trout.....						
<i>Salmo fario</i> —Brown trout.....					67,277	
<i>Salmo fario</i> —Hybrid brown trout (Brown trout—Atlantic salmon).....						
<i>Oncorhynchus nerka</i> —Sockeye salmon....	83,284	35,796,328	60,877,489	1,880,000	4,519,269	1,084,734
<i>Oncorhynchus tshawytscha</i> —Spring salmon.....		391,435	666,779		295,938	27,900
<i>Oncorhynchus kennerlyi</i> —Kennerly's salmon.....		375,000	336,870			
<i>Oncorhynchus kisutch</i> —Coho salmon.....		200,000	490,673			
<i>Salvelinus fontinalis</i> —Speckled trout.....		99,150	571,736	1,220,072	5,964,847	1,448,265
<i>Cristivomer namaycush</i> —Salmon trout.....					148,745	
	94,134	40,259,013	67,839,457	7,237,079	22,667,183	5,221,645

Species	Fingerlings			Yearlings and Older	Total distribution
	No. 3	No. 4	No. 5		
<i>Salmo salar</i> —Atlantic salmon.....	1,000,247	314,070	6,000	29,541	18,717,827
<i>Salmo salar sebago</i> —Landlocked salmon..	1,282			12,495	102,324
<i>Salmo irideus</i> —Rainbow trout.....	14,445	27,955	23,000	21,595	1,419,908
<i>Salmo clarkii</i> —Cutthroat trout.....				206	1,792,197
<i>Salmo rivularis</i> —Steelhead salmon.....		31,661			129,450
<i>Salmo rivularis kamloops</i> —Kamloops trout.....					
<i>Salmo levenensis</i> —Loch Leven trout.....			911	87	6,094,509
<i>Salmo fario</i> —Brown trout.....	11,100	15,589		871	871
<i>Salmo fario</i> —Hybrid brown trout (Brown trout—Atlantic salmon).....				28,720	122,686
<i>Oncorhynchus nerka</i> —Sockeye salmon....	99,112	19,836	93,719	6,010	6,010
<i>Oncorhynchus tshawytscha</i> —Spring salmon	23,915				104,453,771
<i>Oncorhynchus kennerlyi</i> —Kennerly's salmon.....					1,405,967
<i>Oncorhynchus kisutch</i> —Coho salmon.....					711,870
<i>Salvelinus fontinalis</i> —Speckled trout....	347,375	208,116	121,288	99,084	690,673
<i>Cristivomer namaycush</i> —Salmon trout....	863	700			10,079,933
					150,308
	1,498,339	617,927	244,918	198,609	145,878,304

In addition to the above 511,745 cutthroat trout eyed eggs and fry were purchased from the Cranbrook Rod and Gun Club, and planted direct as follows:—

Arrow lake.....	66,000 eyed eggs
Crow's Nest lake.....	50,000 fry
Dunbar lakes.....	50,000 eyed eggs
Elk river.....	205,745 "
Goat river.....	105,000 "
Paddy Ryan lakes.....	35,000 "
	<hr/>
	511,745

Inspections were continued with a view to locating waters where fish eggs might be obtained in sufficient quantities to warrant the establishing of collecting camps and also with a view to locating sites where the Fish Cultural Service might be extended advantageously to districts that are not readily accessible from existing hatcheries.

Experiments with equipment, methods and foods of various kinds were continued at several hatcheries. The experiments and the investigations in relation to fish cultural problems that were made by the Biological Board of Canada are referred to in Appendix No. 2 of the Report of the Department of Fisheries for 1935-36.

The Fish Cultural Branch participated with units showing hatchery products and equipment in exhibits that were made at Kentville, Lunenburg, Halifax and Yarmouth, Nova Scotia, at Saint John and Fredericton, New Brunswick, and at the Sportsmen's Show, Boston, Mass.

Some 15,319 suckers, approximately 10·4 tons in weight were destroyed in the thoroughfare between First and Second lakes, Loch Lomond, and in Wilmot stream, which flows into Loch Lomond, New Brunswick. Some 6,000 carp, squawfish and suckers were also destroyed in traps that were operated for the purpose at Duck and Wood lakes in the Okanagan district, some 2,000 chub, squawfish and suckers in a trap at Lac La Hache, and some 1,699 suckers in a trap in Sweltzer creek, British Columbia.

Twenty-three main hatcheries, eleven subsidiary hatcheries, nine salmon-retaining ponds and several egg-collecting stations were operated in 1935. The output from these establishments was as follows:—

THE FOLLOWING TABLE SHOWS THE HATCHERIES OPERATED, THEIR LOCATION, DATE OF ESTABLISHMENT, THE SPECIES AND THE NUMBER OF EACH SPECIES DISTRIBUTED FROM EACH HATCHERY DURING 1935

Estab- lished	Hatchery	Location	Species	Green eggs	Eyed eggs	Fry	Advanced fry	Fingerlings					Year- lings and older	Total distrib- ution by species	Total distrib- ution by hatcheries
								No. 1	No. 2	No. 3	No. 4	No. 5			
1929	Antigonish.....	Fraser's Mills, N. S.	Atlantic salmon.. Rainbow trout... Speckled trout... Atlantic salmon... Landlocked sal- mon.	..... ..... 3,000 14,200 (e) 8,050	..... ..... ..... ..... .....	..... ..... ..... ..... .....	260,000 560,104 ..... ..... .....	700,000 900,177 1,193,975 ..... .....	20,279 295,000 39,700 3,710 .....	..... ..... 17,500 ..... .....	..... ..... 45,300 ..... .....	..... 795 29,149 ..... .....	980,279 795 1,850,230 1,255,925 3,710	..... ..... 2,831,304 ..... .....	
1876	Bedford.....	Bedford, N. S.	Atlantic salmon.. Rainbow trout... Speckled trout... Atlantic salmon... Landlocked sal- mon.	..... ..... ..... ..... 50	..... ..... ..... ..... .....	..... ..... ..... ..... .....	45,000 386,000 ..... ..... .....	414,641 184,788 ..... ..... .....	116,450 30,000 36,418 ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	576,141 600,788 36,418 ..... .....	1,835,776 ..... ..... ..... .....	
1912	Lindloff (a).....	St. Peter's, N. S.	Atlantic salmon.. Rainbow trout... Speckled trout... Atlantic salmon... Landlocked sal- mon.	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	500,000 ..... ..... ..... .....	2,170,000 ..... ..... ..... .....	440,000 28,982 230,000 13,065 .....	259,038 96,339 412,105 1,282 .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	
1902	Margaree.....	N. E. Margaree, N. S.	Atlantic salmon.. Rainbow trout... Speckled trout... Atlantic salmon... Landlocked sal- mon.	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	500,000 ..... ..... ..... .....	2,170,000 ..... ..... ..... .....	440,000 28,982 230,000 13,065 .....	259,038 96,339 412,105 1,282 .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	
1913	Middleton.....	Middleton, Anna- polis Co., N. S.	Atlantic salmon.. Rainbow trout... Speckled trout... Atlantic salmon... Landlocked sal- mon.	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	500,000 ..... ..... ..... .....	2,170,000 ..... ..... ..... .....	440,000 28,982 230,000 13,065 .....	259,038 96,339 412,105 1,282 .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	
1933 1929	Nictaux Falls (d.) Yarmouth.....	Nictaux Falls, N. S. South Ohio, N. S.	Atlantic salmon.. Rainbow trout... Speckled trout... Atlantic salmon... Landlocked sal- mon.	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	110,000 ..... ..... ..... .....	90,000 ..... ..... ..... .....	265,000 ..... ..... ..... .....	107,805 20,000 95 7,045 .....	17,395 22,800 25,955 23,000 .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	
1928	Florenceville.....	Florenceville, N. B.	Atlantic salmon.. Rainbow trout... Speckled trout... Atlantic salmon... Landlocked sal- mon.	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	600,000 ..... ..... ..... .....	985,000 ..... ..... ..... .....	270,200 ..... ..... ..... .....	24,000 ..... ..... ..... .....	7,090 14,748 57,000 ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	
1880	Grand Falls.....	Grand Falls, N. B.	Atlantic salmon.. Rainbow trout... Speckled trout... Atlantic salmon... Landlocked sal- mon.	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	600,000 ..... ..... ..... .....	985,000 ..... ..... ..... .....	270,200 ..... ..... ..... .....	24,000 ..... ..... ..... .....	7,090 14,748 57,000 ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	
1874	Miramichi.....	South Esk, N. B.	Atlantic salmon.. Rainbow trout... Speckled trout... Atlantic salmon... Landlocked sal- mon.	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	144,704 ..... ..... ..... .....	1,169,296 ..... ..... ..... .....	394,255 ..... ..... ..... .....	273,299 ..... ..... ..... .....	52,954 ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	
1874	Restigouche.....	Flatlands, N. B.	Atlantic salmon.. Rainbow trout... Speckled trout... Atlantic salmon... Landlocked sal- mon.	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	260 ..... ..... ..... .....	89,590 ..... ..... ..... .....	1,000 ..... ..... ..... .....	7,722 ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	
1914	Nipisiguit (a).....	Bathurst Mines, N. B.	Atlantic salmon.. Rainbow trout... Speckled trout... Atlantic salmon... Landlocked sal- mon.	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	159 ..... ..... ..... .....	2,220 ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	..... ..... ..... ..... .....	
1914	Saint John.....	Saint John, N. B.	Atlantic salmon.. Brown trout, hy- brids. Landlocked sal- mon.	(e) 2,800	4,250	200	550,075	175,055	3,060	6,277	.....	.....	13,695	755,412	.....
1906	Kelly's Pond.....	Southport, P. E. I.	Loch Leven trout Speckled trout.. Atlantic salmon.. Rainbow trout... Speckled trout... Cutthroat trout.. Rainbow trout... Salmon trout... Speckled trout.. Rainbow trout... Cutthroat trout.. Rainbow trout... Rainbow												



1916	Cultus lake.....	Cultus lake, Ved-der Crossing, B.C.	Cutthroat trout.....	55,000	49,401	47,936	104,401
			Sockeye salmon.....	5,663,880		36,500	5,765,100
			Steelhead salmon.....	(c) 53,234		26,568	63,068
1927	Smiths Falls (a).....	Cultus lake, Ved-der Crossing, B.C.	Kamloops trout.....	10,000	43,706		43,706
			Sockeye salmon.....			93,551	103,551
1905	Harrison lake (a).....	Harrison lake, B.C.	Sockeye salmon.....	11,618,840	13,794,612		25,413,452
1906	Pemberton.....	Owl Creek, B.C.	Kamloops trout.....	90,000	64,700		154,700
			Sockeye salmon.....		19,309,300		19,309,300
1917	Pitt lake.....	Pitt river, Alvin, B.C.	Kamloops trout.....	2,180,000	3,556,940	826	826
			Sockeye salmon.....	7,943,905	7,625,460	168	5,796,834
1903	Lakeelse lake.....	Lakeelse lake, via Terrace, B.C.	Sockeye salmon.....				15,569,533
1908	Babine lake.....	Babine lake, via Topley, B.C.	Sockeye salmon.....	1,546,030	3,748,873	879,945	6,174,848
1906	Rivers Inlet.....	Rivers Inlet, B.C.	Sockeye salmon.....	3,413,778	7,945,183		11,358,961
			Spring salmon.....		318,140	59,861	378,001
1911	Anderson lake.....	Anderson lake, Kildonan, Vancouver Island, B.C.	Sockeye salmon.....	1,472,440	4,897,121		6,369,561
			Spring salmon.....		92,903	23,915	116,818
1933	Sproat river (c).....	Sproat river, B.C.	Spring salmon.....	316,435			316,435
1911	Cowichan lake.....	Lake Cowichan, Vancouver Island, B.C.	Atlantic salmon.....				4,803
			Brown trout.....			67,277	122,686
			Coho salmon.....	200,000	490,673	11,100	690,673
			Spring salmon.....	75,000	255,736	27,900	594,713
1911	Kennedy lake.....	Kennedy lake, Tofino, Vancouver Island, B.C.	Steelhead salmon.....	1,947,455	1,880,000	31,661	66,382
			Sockeye salmon.....			1,024,790	8,592,381
1933	Beaver lake (a).....	Kelowna, B.C.	Kamloops trout.....	555,000	330,185		885,185
1922	Lloyd's creek (a).....	Kamloops, B.C.	Kamloops trout.....	1,375,500	910,675		2,286,175
1934	Argentina (a).....	Argentina, B.C.	Kamloops trout.....		468,800		468,800
1923	Nelson.....	Nelson, B.C.	Kamloops trout.....	287,923	230,548	85	518,556
			Kennedy's salmon.....	375,000	336,870		711,870
			Speckled trout.....	95,000	248,539		343,539
1928	Penask lake (a).....	Penask lake, via Quilchena, B.C.	Kamloops trout.....	151,000	257,902		408,902
1928	Summerland (a).....	Summerland, B.C.	Kamloops trout.....	698,193	629,379		1,327,572
				94,134	7,237,079	617,927	145,878,304
				40,259,013	67,839,457	1,498,339	145,878,304

(a) Subsidiary hatchery. (d) Pond and rearing station combined.  
(c) Evening station. (e) All autumn collection 1935, except 50 Atlantic salmon eggs.

The eggs, fry and fingerlings included in this distribution, with the exceptions indicated, were from collection in the autumn of 1934 and the spring of 1935. In addition to the above 511,745 Cutthroat trout eyed eggs and fry were planted direct in British Columbia waters as detailed in previous statement.

## HATCHERY OUTPUT, BY PROVINCES, OF EGGS, FRY, FINGERLINGS, YEARLINGS AND OLDER FISH DURING 1935

	Green eggs	Eyed eggs	Fry	Advanced fry	Fingerlings					Yearlings and older	Total distrib- ution by species	Total distrib- ution by province
					No. 1	No. 2	No. 3	No. 4	No. 5			
<i>Nova Scotia</i> —												
Atlantic salmon.....	8,050	14,200		1,256,000	4,508,763	984,979	712,200	307,793	6,000	1,000	7,798,985	12,348,339
Kanloops trout.....										87	87	
Landlocked salmon.....					17,700	16,775	1,282				35,757	
Rainbow trout.....					60,000	36,418	7,045	27,955	23,000	21,595	116,013	
Salmon trout.....		3,050		605,104	2,131,818	975,632	273,144	147,646	121,288	78,952	4,336,634	
Speckled trout.....												
<i>New Brunswick</i> —	8,050	17,250		1,861,104	6,718,281	2,013,804	994,534	483,394	150,288	101,634	12,348,339	
Atlantic salmon.....	2,800	4,250	1,835,614	2,340,735	4,153,445	1,529,525	288,047	6,277		23,738	10,184,431	
Brown trout, hybrids (Brown trout—At- lantic salmon).....										6,010	6,010	
Landlocked salmon.....					54,072					12,495	66,567	
Loch Leven trout.....		1,100	323,197	269,863	3,492,291	182,633	60,676	57,000		871	871	
Speckled trout.....	2,800	5,350	2,158,811	2,610,598	7,699,808	1,712,158	348,723	63,277		20,132	4,406,892	
<i>Prince Edward Island</i> —										63,246	14,664,771	14,664,771
Atlantic salmon.....				192,000	537,608						729,608	
Rainbow trout.....				30,000	11,658						11,658	
Speckled trout.....					114,878						144,878	
<i>Alberta</i> —				222,000	664,145						886,145	886,145
Cutthroat trout.....		50,000		36,000	1,601,590						1,687,796	
Rainbow trout.....		116,034	75,000	312,272	749,770	31,760	7,400			206	1,292,236	
Salmon trout.....				315,105	88,745	290,000	13,555	700			89,445	
Speckled trout.....					225,860			3,470			847,900	
<i>British Columbia</i> —		166,034	75,000	663,377	2,665,965	321,760	20,955	4,170		206	3,917,467	3,917,467
Atlantic salmon.....												
Brown trout.....					67,277		11,100	15,589		4,803	4,803	
Coho salmon.....		200,000	490,673							28,720	122,686	
Cutthroat trout.....		55,000	49,401								690,673	
Kanloops trout.....		3,157,616	2,935,895						911		104,401	
Kennedy's salmon.....		375,000	336,870								6,094,432	
Sockeye salmon.....	83,284	35,796,328	60,877,459	1,880,000	4,519,269	1,084,734	99,112	19,836	93,719		711,870	
Speckled trout.....		95,000	248,539								104,453,771	
Spring salmon.....		391,435	666,779		295,938	27,900	23,915				343,539	
Steelhead salmon.....					36,500	61,289		31,661			1,405,967	
	83,284	40,070,379	65,605,646	1,880,000	4,918,984	1,173,923	134,127	67,086	94,630	33,523	114,061,582	114,061,582
											145,878,304	145,878,304

In addition to the above 511,745 cutthroat trout eyed eggs and fry were planted direct in British Columbia waters as detailed in previous statement.

The Canadian National Railway, the Canadian Pacific Railway, the Esquimalt and Nanaimo Railway and the Dominion Atlantic Railway Companies continued their generous assistance and co-operation by furnishing free transportation for shipments of game fish and game fish eggs with their attendants. The extent of this co-operation is indicated in the following summary:—

Railways	Total mileage on trip passes	Number of passages	Mileage baggage car permits			Number of cases or cans			Number of permits
			Full	Empty	Total	Full	Empty	Total	
C.N.R.....	6,163	25	3,165	3,094	6,259	71	90	161	43
C.P.R.....	7,973	50	6,818	6,386	13,204	310	297	607	95
E. & N.R.....	122	2	61	61	122	2	2	4	2
D.A.R.....	824	8	412	412	824	8	8	16	2
	15,082	85	10,456	9,953	20,409	391	397	788	142

NOTE:—Number of passages refers to transportation one way. A return trip counts as two passages. Number of permits refers to one way passages for cases or cans.

An increased interest is being shown in fish cultural operations and assistance was tendered by private individuals and local organizations such as the boards of trade and fish and game clubs, angling and protective associations, service clubs, etc. Great assistance was afforded by the Madawaska Fish and Game Club in distributing hatchery output in the waters in which they are interested. In addition to the help of its members, the club provided motorboats, teams, canoes, etc., where they were needed. The Grand Falls Fish and Game Club also extended valuable assistance of a similar nature.

Officials and employees of other dominion departments, provincial officials, officers and crews of fishery patrol and protection boats, and other branches of this department have cordially co-operated in all instances where they could be of assistance. The Research Committee of the Biological Board continued its courteous consideration of all fish culture problems that were referred to it.

An exchange of Kamloops trout for salmon trout eyed eggs was made with the Department of Game and Fisheries, Toronto, Ontario, and speckled trout for ouananiche salmon eyed eggs with the Department of Labour, Game and Fisheries, Quebec, details of which are given in a subsequent statement.

As a practical test to ascertain if Atlantic salmon introduced into new environment retain the habits of their native rivers, Restigouche salmon which provide good angling during May, June and the greater part of July, were distributed in the Saint John and Nashwaak rivers. Some anglers believe that salmon will retain in a new habitat the habits their parents had in the old. Others maintain that imported stock will take on the ways of the native stock of any stream into which they are introduced. The experiment should provide some proof as a considerable number of the Restigouche fish were marked before they were liberated in the Saint John river and its tributaries.

Observations made by Mr. H. C. White under the direction of the Biological Board, indicate that artificial propagation or artificial feeding does not weaken racial instinct of fish to select suitable food nor do they lose their ability to forage for themselves because of the time spent in hatchery troughs and ponds. There had been nothing to indicate that artificially hatched fry did not thrive when liberated in open water. The evidence supplied by observations and experience had been in the other direction, but Mr. White's investigation furnishes definite information on this point.



An investigation was carried on in Prince Edward Island. Several lots of speckled trout were studied. Some of the fry had been hatched naturally in the streams and the balance were hatchery product. Some of the hatchery fry were not liberated until they had become somewhat emaciated and weakened, and it might, therefore, be expected that they would not be in a condition to look after themselves very well. After intervals of varying length, from 48 to 88 hours, numbers of the different groups of fry were recaptured and their stomach contents were examined and compared with the contents of the stomachs of the naturally hatched fry. Mr. White found that the artificially hatched fry fed in a natural manner and in the same way as the native fry, taking out in the main the same food. Although the hatchery fry had no experience with food of any kind except liver, before they were liberated, they knew instinctively what organisms were the accepted diet of young trout.

At Antigonish hatchery one pond of speckled trout yearlings, produced by selective breeding, yielded an average of 963 eggs each and the average yield of all yearlings stripped was 605 eggs each, the latter being an increase of approximately 150 eggs per yearling fish over the yield of 1934. The yield from the two-year-old fish was also higher than it was during the previous year. The average yield of three- and four-year-old fish was smaller, principally due to the fact that a large proportion of these fish were of the Lochaber lake strain, which are poor yielders as compared with the hatchery fish.

An interesting experiment was made at Margaree hatchery in regard to the relative efficiency of natural and artificial spawning of speckled trout. A spring-fed pond was divided into three sections, each approximately 10 feet long by 5 feet wide with the bottom composed of fine and coarse gravel. One pair of trout was placed in each section on October 31 and removed on November 15 after they had spawned. The females were 14, 15 and 13 ounces in weight before, and respectively 11, 12½ and 11 ounces in weight after they had spawned. The loss in weight, due to spawning, was 7½ ounces or 17·8 per cent of their original weight. One thousand one hundred and fourteen fingerlings were later recovered from these enclosures.

Three females, 14, 16 and 13½ ounces in weight were stripped in the usual way. Their eggs were handled in the hatchery and produced 4,263 fry in the April following. These fish lost 6·5 ounces or 15·4 per cent of their original weight due to stripping. The loss in weight in both groups of six trout was 16·3 per cent of their original weight, which is considerably smaller than the percentage loss in Atlantic salmon referred to later in this report.

During the autumn of 1934, three spawning beds for Atlantic salmon were made below No. 3 development in the Mersey river, Nova Scotia. These beds were examined during the following January. It was found that one of them, which was about 11 feet long by 5 feet wide, its length at right angles to the current, had been used by at least two pairs of salmon.

As the natural spawning beds in the Mersey river were very largely destroyed by hydro development and in view of the experience of 1934, three additional beds were made during 1935 and were used to a considerable extent during the autumn of that year. The pools in the fishway in this development were screened and used experimentally for rearing salmon. Unfortunately the screens were undermined by ascending eels and most of the fish escaped into the river.

During the season 149 Atlantic salmon ascended the fishway and were counted into the Nictaux retaining pond between 6 a.m. and 6 p.m. and 17 between 6 p.m. and 6 a.m. The latter group ascended shortly after dark and just before daylight in the morning. The former group ascended mostly between 7 and 9 o'clock in the morning, 11 and 12.30 noon, with an occasional one in the afternoon.

One hundred and seventy-one salmon were taken for fish cultural purposes in the Sackville river near the Bedford hatchery between August 28 and October 31, inclusive. Of this number 73 were taken on September 10 and 11. The river was quite low prior to September 10, when a heavy rainfall occurred and the salmon immediately began to move. This is a further indication of the effect of rainfall or increased flow of water on the ascent of salmon, other conditions being satisfactory.

On November 30, 1935, a number of adult speckled trout were marked and distributed from Yarmouth hatchery in the outlet of lake Skinner, and the following spring a number of these fish were caught at Hicks' falls, a distance of from 10 to 12 miles from the point of liberation. The fish went down the outlet from lake Skinner into the Carleton river, then proceeded upstream to where they were caught. On April 15, 1936, a number of two-year-old speckled trout were distributed in lake Ellenwood. On April 25, eight of these were caught at Whitehouse Mill on the Salmon river, a distance of some three miles from the point of distribution. Twenty two-year-old speckled trout distributed on April 14, 1936, in Gardener brook were caught at lake Edward dam, a tributary of Gardener brook, one mile from the point of distribution. The last group was released in lake Edward above the dam. With the exception of those liberated in lake Skinner, the fish had proceeded upstream a considerable distance in a comparatively short time. Lake Skinner, however, has no inlet which the fish could ascend and this condition may have something to do with the fish having gone downstream.

The Nipisiguit hatchery, which is subsidiary to the Restigouche hatchery, obtained its water supply from Little Church brook which flows into the Nipisiguit river not far from Grand Falls on that stream. The water supply creek flows through a quicksand formation and has always given some trouble on account of quicksand and other sediment being carried into the hatchery. In addition to this sediment, Little Church creek has been polluted in recent years in other ways, such as drainage from hardwood ashes, manure piles, etc., outside the hatchery property. Heavy losses in eggs occurred during the last few years and the Pathologist of the Biological Board attributes these losses to some toxic matter or polluting substance.

The transportation facilities available at the time that the Nipisiguit hatchery was established did not permit of the Nipisiguit river being stocked effectively from the Restigouche hatchery. These facilities have since then been greatly improved and it is now quite feasible to transfer fry from Restigouche to the Nipisiguit and other streams in the district. Under these conditions the Nipisiguit hatchery was discontinued at the close of the distribution season of 1935.

During the season Little river, below the reservoir from which the Saint John hatchery obtains its water supply, was diverted to a new channel, thus removing the danger that has always existed of flooding the hatchery ponds during high freshets. The wire screens previously used in the outlets of the trout ponds were replaced by gates made of wooden slats which have proved far superior to the wire screens, as the former do not clog and last much longer.

During the year the Cobequid hatchery was constructed at Jackson on Second river, river Philip, Cumberland county, Nova Scotia. The main building, which includes the hatchery, men's quarters, office, feed room, and cold storage, is 38 feet by 71 feet 6 inches. The hatchery is 36 feet 8 inches by 42 feet 6 inches and is equipped with 30 hatching troughs, each 16 feet long, 10½ inches wide and 6½ inches deep inside; 6 hatching troughs 16 feet long, 20 inches wide and 10 inches deep. The Superintendent's dwelling, which is equipped with all modern conveniences, is 30 feet by 30 feet. In addition to the above a combined storage room, ice-house and garage 21 feet by 50 feet 5 inches and a concrete water supply dam were built and the water supply pipes laid. Con-



struction was brought to a close in the late autumn by unfavourable weather conditions, but arrangements have been made to complete this establishment with rearing and brood ponds early next season.

At the close of the fiscal year, March 31, 1935, the department lost the valuable services of three of its oldest fish cultural officers through retirement and superannuation, as they had reached the age limit. The officers in question were:—

Mr. J. H. Castley, Superintendent of the Cowichan lake hatchery, British Columbia, who was first employed in 1910 and who was retired on superannuation after nearly twenty-five years continuous service.

Mr. W. A. Mowat, Superintendent of the Restigouche hatchery, New Brunswick, who was first employed in 1886 and who was retired on superannuation after nearly forty years' service.

Mr. H. C. Crawford was first employed on the construction of the sockeye salmon hatchery at Stuart lake in northern British Columbia in 1907. At the time of construction this portion of British Columbia was not as readily accessible as it is at present. The Canadian National Railway had not been built, supplies, etc., had to be brought in from outside and taken up the Skeena by river steamer, packed around the rapids by Indians, and finally transported by pack-horse and by boat to the hatchery site. Mr. Crawford continued at the hatchery after construction was completed and rose through various stages until he was finally appointed Superintendent of the hatchery. He was employed in the same capacity at Babine lake, and for shorter periods at Pitt, Lloyd's creek and other hatcheries, finally retiring as Superintendent of the Nelson hatchery in southern British Columbia with nearly 28 years' experience in the fish cultural service.

## MARITIME PROVINCES EASTERN DIVISION

### DISTRICT SUPERVISOR OF FISH CULTURE, JAMES CATT

Speaking generally, in spite of adverse conditions brought about by excessive drought, hatchery operations showed a distinct and efficient progress. Fish cultural operations, at present made up to a major extent by hatchery work, were of greater value than has heretofore been achieved in the Maritimes. This was largely due to an increased efficiency in the hatchery staffs, closer co-operation with the administrative branch of the department, the fish and game protective associations for the maritime provinces and closer association with the directors and staffs of the St. Andrews and Halifax biological stations.

The local or county branches of the fish and game protective associations rendered valuable co-operation in the distribution of hatchery output and their officers, who attended the meetings convened by the District Supervisors of Fisheries for the purpose of discussing local conditions and the best disposal to make of available hatchery stock, contributed much intimate information regarding their respective districts. These associations at the annual meetings of their parent bodies further showed their interest in fish cultural work by passing resolutions of appreciation of the department's efforts after specific discussion of the work carried out in past and suggested future programs. Letters to this effect were received from Dr. E. H. Cook, president of the New Brunswick Fish and Game Protective Association and Rev. A. W. L. Smith, president of the Nova Scotia Fish and Game Protective Association.

Whilst generalized in the foregoing, certain specific cases of co-operation might be mentioned.

Major D. H. Sutherland, Chief Supervisor of Fisheries personally attended many conferences on distribution. Under his direction the district supervisors and their inspectors carried out a program of assistance in restocking the waters



of the Maritimes. It was particularly gratifying to observe that much work along these lines was done in Supervisor J. F. Calder's district. Inspector C. E. Kilpatrick, under Supervisor L. H. Parks, has as in the past been of great assistance in stock distribution from the Florenceville hatchery. Inspector J. A. Jardine, under Supervisor Colonel A. L. Barry, has obtained a great deal of data as to the stocking requirements of the Restigouche district. In Supervisor H. H. Marshall's district, Inspector J. P. Buchanan not only assisted in distribution but also in fish cultural experimental work. Inspector P. E. Filleul assisted in one of the most difficult distributions attempted in the Maritimes, which was restocking the headwaters of the Sissiboo river. Inspector Bruce Hunter assisted in the examination of the upper waters of the Sissiboo, and obtained extremely valuable data as to the possibility for future collections of wild speckled trout ova in the lakes in North Mountain area and the collection of Atlantic salmon ova from the headwaters and tributaries of the Annapolis river. He also furnished data on the trout fishery of the lakes of North Mountain together with an accurate map, which describing the accessibility of the several waters, should prove of great assistance to the department in its future operations.

Supervisor E. D. Fraser through his inspectors obtained most valuable information in regard to failures and successes of stocking the waters in his district. He has consistently shown a keen and useful interest in fish cultural operations.

Under Supervisor A. G. McLeod, Inspector T. H. Kitchen obtained much information with regard to stocking the waters in his area. He has also shown a great deal of interest in endeavouring to locate suitable sites on which may be constructed fish cultural plants, both rearing ponds and hatcheries.

The Government of New Brunswick has during the year sent representatives to discuss fish cultural matters at local conferences on distribution. They have assisted in obtaining data on experimentally closed waters, those temporarily closed to angling, to furnish advice as to the possibility of future collections of wild trout eggs and to offer the services of game wardens of the Department of Lands and Mines to generally assist the Department's work in any such matter as may be seasonable.

In Nova Scotia the department has received assistance comparable to that of New Brunswick.

The directors of the Atlantic Biological station, St. Andrews, and of the Atlantic Fisheries Experimental station, Halifax, were at all times most cordial in their readiness to render assistance. As far as possible Doctor A. H. Leim from St. Andrews station personally investigated many fish cultural problems. His work included the obtaining of data as to the efficiency of the rearing pond on Stephenson's brook, Loch Lomond, built and operated by the Saint John branch of the New Brunswick Fish and Game Protective Association and the Loch Lomond Protective Association. As the opportunity occurred he also visited the experimental natural rearing pond near Wittenberg, Nova Scotia. Doctor D. B. Finn from the Halifax station not only assisted the Department's officers by advice, but when requested to do so immediately supplied certain equipment such as indicators for pH determinations. Doctor R. H. M'Gonigle from the Saint Andrews station investigated all hatchery epidemics in so far as limited funds permitted him. He also carried out valuable work in connection with the elimination of algae at the Kelly's Pond hatchery.

Dr. M. W. Smith of the Atlantic Biological station spent considerable time in field observations; in determining scientific data in connection with the copper sulphating experiment of Jesse lake and in the selection of Boar's Back and Tedford lakes in which the aforesaid experiment is to be continued; in connection with a rearing pond at Bishop's brook, New Minas, and Sutton's pond, Kentville, operated by the Kentville branch of the Nova Scotia Fish and Game Protective Association, and the proposed rearing pond at Coldbrook near

Kentville by the same branch. Bishop's and Sutton's brooks were stocked from the Middleton hatchery, but results of the stocking will not be determined until the summer of 1936. He also gave valuable information as to aquatic trout food organisms to several of the hatchery superintendents and the District Supervisor of Fish Culture to whom his field contact was such that he was enabled to illustrate his remarks.

A biological and a fish cultural examination and an engineering survey were also made of a possible rearing pond site at Parker brook, Middleton, Nova Scotia.

The work of the Saint John branch of the New Brunswick Fish and Game and the Loch Lomond Protective Associations in connection with the Stephenson's brook pond is to be highly commended. The actual work of stocking the pond and of making determinations as to the results was chiefly carried out by the staff of the Atlantic Biological station and the Department's fish cultural employees at the Saint John hatchery.

Members of the Cape Breton branches of the Nova Scotia Fish and Game Protective Association were of material assistance in the distribution of stock from the Margaree hatchery in the Sydney area. Their very keen interest and constructive criticism have been most helpful.

Successful live fish exhibits were held during the year at Kentville, Lunenburg, Halifax and Yarmouth under the supervision of Mr. H. V. Gates, Superintendent of the Yarmouth hatchery; at Fredericton under Mr. George Sutherland, Superintendent of the Florenceville hatchery, and at the Saint John Exhibition with Mr. J. D. Nichol, Superintendent of the Saint John Hatchery, in charge. Assistant Mr. W. T. Owens with representative specimens of hatchery fish from the Florenceville and Saint John hatcheries, New Brunswick, was loaned in connection with the exhibit made at the Sportsmen's Show at Boston.

At Margaree hatchery the treatment of speckled trout fingerlings with copper sulphate followed by acetic acid proved successful in combating the diseases which affected this species. Similar work with excellent results was carried out at Antigonish hatchery.

The salmon rearing facilities at Nictaux Falls were increased, which will enable a large production of speckled trout fingerlings to be made from Steven's brook ponds as eggs and fry may be transferred to Nictaux Falls and later moved in the fingerling stage to Steven's brook ponds for further growth.

A new salmon and trout hatchery, called Cobequid hatchery, with Superintendent's residence, complete, was built at Second river, River Philip, Cumberland county, Nova Scotia. This plant will be in operation next year.

A supply of landlocked salmon was provided by Bedford and Middleton hatcheries for the ponds at Grand lake, Nova Scotia, operated by the Provincial Government.

The elimination of suckers from Wilmot stream, the main trout nursery for Loch Lomond, and from the thoroughfare between First and Second lakes, Loch Lomond, New Brunswick, was continued in 1935.

Deep lake, Queens county, Nova Scotia, promises to provide excellent rainbow trout angling. It is comparatively small, being approximately 40 acres in area, fed by underground springs and has no outlet. It was stocked with yearling rainbow trout in 1934. During test fishing to ascertain how the trout were doing, fish weighing a pound and measuring 12 inches were taken. When liberated the fish were between 5 and 6 inches long and had weighed a few ounces. The increase in growth and the numbers of fish that are apparent in the lake promises some excellent sport.

Lake George, in southwestern Nova Scotia, may now be included in the angling waters of that region. Until a few years ago it carried a large population of perch and was almost barren of trout. It was stocked with speckled trout yearlings from the Yarmouth hatchery and it is reported that in 1935 numbers of large trout were taken by the sportsmen.



## ANTIGONISH HATCHERY

*K. G. Shillington, Superintendent*

An excellent distribution was made of Atlantic salmon advanced fry and fingerlings, speckled trout advanced fry, fingerlings, yearlings and older fish which exceeded the size of those of preceding years. Some rainbow trout yearlings and four year old fish were also distributed. Three thousand speckled trout eyed eggs were shipped to the Seignior Club, Montebello, Quebec.

One fifty-foot circular pond was constructed on the hatchery grounds. A new storage dam was built at the outlet of Loch Katrine so that a reserve of water will in future be available. Concrete bottoms were made in nineteen rectangular ponds; also many additional improvements to the hatchery ponds with a view to rearing fish more successfully.

A collection of 5,647,161 speckled trout eggs was made from the fine quality of brood stock developed at the hatchery, thus enabling the plant to become a source of supply for several of the maritime hatcheries. The hatchery ponds also produced 109,000 rainbow trout eggs.

Evidence of the importance of selective breeding and efficient feeding is apparent at this hatchery. One hundred fingerlings, the progeny of selected parents, weighed all told 15.2 ounces. At the end of the first month of the test their aggregate weight increased to 50.5 ounces or more than 230 per cent; in the next three months there was a further gain of over 300 per cent and their total weight rose to 223 ounces. The next seven months brought their weight to 700 ounces, an increase of over 460 per cent in eleven months. This is an average weight of 7 ounces each and according to Doctor Wm. E. Ricker's studies is equivalent to the average weight of speckled trout in open waters of Ontario on August 1 of their fourth year, as stated by Doctor Ricker in Publications of the Ontario Fisheries Research Laboratory, No. 44, 1932.

In March 1,000,000 Atlantic salmon eyed eggs were received from Miramichi hatchery. Outgoing shipments were: 500,000 speckled trout eyed eggs to Bedford hatchery, 250,000 each to Lindloff and Restigouche hatcheries, 100,000 each to Margaree and Miramichi hatcheries and 1,000,000 each to Middleton and Yarmouth hatcheries and 64,000 rainbow trout eyed eggs to Lindloff hatchery. Distributions for the season were: Atlantic salmon 980,279, rainbow trout 795, and speckled trout 1,850,230; total, 2,831,304.

## BEDFORD HATCHERY AND SACKVILLE RIVER SALMON POND

*George Heatley, Superintendent*

In spite of heavy losses through an epidemic in speckled trout fingerlings, a good distribution of this species was made from Bedford hatchery this year. A few Atlantic salmon green and eyed eggs and speckled trout eyed eggs were shipped to various institutions, and a large number of Atlantic and some landlocked salmon fingerlings were produced and distributed.

The results of capacity tests conducted in rearing ponds at this hatchery proved to be futile in an endeavour to raise any great number of fry to the fingerling stage. Arrangements are therefore being made to increase the distribution in the early spring in order to prevent future heavy losses later in the season when adverse conditions occur.

Twenty-seven thousand landlocked or sebago salmon eggs were collected at Grand lake.

In the autumn of 1934, an unusually large number of Atlantic salmon were in evidence in the upper part of Bedford basin, an extension of Halifax harbour entered by the Sackville river. The Superintendent of the Bedford hatchery at Sackville reported at the time that "the basin was practically alive with salmon." An extended period of dry weather brought the water in the



Sackville river to an unusually low level, and after waiting about the mouth of the river for some time most of the salmon, which were apparently headed for this stream, evidently went in search of more favourable conditions elsewhere. Very few of these salmon ascended the Sackville river as from early September to early November the river was enclosed by a fence with traps installed to intercept the fish and take them for fish cultural purposes. This particular case is only an example of the possible effect of low water conditions on the movements or the ascent of Atlantic salmon in our eastern rivers.

In February 1,250,000 Atlantic salmon eyed eggs were received from Kelly's Pond hatchery and in March 500,000 speckled trout eyed eggs from Antigonish hatchery. In November 806,400 Atlantic salmon eggs were received from Sackville pond and 2,868,000 from river Philip camp.

Distributions for the year were: Atlantic salmon 1,255,925, landlocked salmon 3,710, and speckled trout 576,141; total, 1,835,776.

Some 171 Atlantic salmon were impounded at Sackville river pond between August 28 and October 31 inclusive, from which there was only a loss of 2. A satisfactory collection of 806,400 eggs was made which were laid down in the Bedford hatchery.

#### LINDLOFF SUB-HATCHERY

*J. C. Goswell, Officer in Charge*

The rearing capacity of this station was increased by the construction of four additional circular ponds. Other improvements include the building of an icehouse and garage.

Eyed eggs received during the season were: 612,196 Atlantic salmon from Miramichi hatchery and 250,000 speckled and 64,000 rainbow trout from Antigonish hatchery. Distributions were made as follows: Atlantic salmon 600,788, rainbow trout 36,418, and speckled trout 45,000; total, 682,206.

#### MARGAREE HATCHERY

*W. D. Turnbull, Superintendent*

The superintendent is to be commended for the excellent distribution of Atlantic salmon and speckled trout stock from the plant this year, which included for the first time some 1,500 speckled trout yearlings.

A very satisfactory collection of 873,574 speckled trout eggs, much larger than the collection of any previous year, was made from the splendid brood stock that is being developed at this hatchery.

Additional improvements were made to rearing ponds and sixteen large troughs constructed during the summer gave excellent results. Trout and salmon fingerlings held in these larger troughs spread out and showed a much better growth than those held in smaller troughs.

From Antigonish hatchery 100,000 speckled trout eyed eggs were received in March. In November and December 5,450,000 Atlantic salmon green eggs were received from Margaree salmon pond. Distributions were: Atlantic salmon 3,649,038, and speckled trout 255,675; total, 3,904,713.

#### MARGAREE SALMON POND

*J. P. Chiasson, Superintendent*

Exceedingly low water conditions in the Margaree river prevented the capture of a large number of early run salmon. Of the 144 early run fish obtained from June 12 to July 29 the loss was 14, the percentage loss being much less than last year.

The fall run of salmon was very satisfactory. Some 560 were impounded from September 17 to November 1. Owing to the scarcity of males additional

salmon were secured for their milt. A total collection of 5,450,000 eggs, exceeding the collection of recent years, was taken and laid down in Margaree hatchery.

#### MIDDLETON HATCHERY AND RIVER PHILIP SALMON POND

*F. M. Millett, Superintendent*

Notwithstanding the disappearance of a large number of speckled trout fingerlings from Steven's ponds a good distribution of this species was made. During October the hatchery pond was drained and 21 speckled trout yearlings were taken and distributed in Lilly lake, Annapolis county. The pond was restocked with some 1,200 speckled trout No. 4 fingerlings.

In addition to speckled trout; Atlantic salmon, landlocked salmon and salmon trout fingerlings were distributed.

Extensive repairs were made to the hatchery dam and spillway.

In July and August 45,000 Atlantic salmon fingerlings were transferred to the newly constructed rearing station at Nictaux Falls.

The following eyed eggs were received during the season: in January 100,000 salmon trout from the Department of Game and Fisheries, via Glenora hatchery, Ontario, and 1,000,665 speckled trout from the Cape Cod Trout Company, Wareham, Mass. In March 30,000 ouananiche salmon from the Department of Labour, Game and Fisheries, Quebec, 30,000 sebago salmon from Saint John hatchery originally collected at Chamcook lakes, 1,000,000 speckled trout from Antigonish hatchery and 600,000 Atlantic salmon from Miramichi hatchery. In the autumn 679,200 Atlantic salmon eggs were received from Nictaux salmon pond and 1,705,100 from river Philip camp.

Distributions from Middleton hatchery were: Atlantic salmon 812,105, landlocked salmon 32,047, salmon trout 60,863 and speckled trout 617,221; total 1,522,236.

Operations at river Philip camp were most successful in 1935, as there was no excessive high water this season. Some 816 salmon were impounded from October 1 to November 9. The total collection was 4,573,100 eggs of which 2,868,000 were laid down in Bedford hatchery and 1,705,100 in Middleton hatchery.

#### NICTAUX SALMON POND AND REARING STATION

*J. W. Heatley, Officer in Charge*

A better run of Atlantic salmon at Nictaux river this year was reflected in a collection of 679,200 ova, which greatly exceeded that of last year. These ova were laid down in Middleton hatchery. Of the 166 salmon obtained from May 18 to November 7 the loss was 12. A hole gnawed in the power dam permitted some 30 impounded salmon to ascend to the storage dam. By permission of the Avon River Power Company the water was shut off the dam for short periods enabling the salmon to be recaptured and returned to the pond.

In addition to the collection of brood salmon, in July and August 45,000 Atlantic salmon fingerlings were received from Middleton hatchery. In January a heavy rain and ice jam demolished the old Nictaux rearing station. During March a new site was located and 10 standard troughs that had been salvaged and 10 new large troughs were set up, over which a roof was built and closed in with drop sides. The new station operated very satisfactorily. Facilities now provide that eggs as well as fry and fingerlings may be carried. Distribution consisted of 42,800 Atlantic salmon in the Nictaux river.



## YARMOUTH HATCHERY

*H. V. Gates, Superintendent*

Operations at the Yarmouth hatchery were successful. An excellent distribution of Atlantic salmon advanced fry, fingerlings and yearlings, rainbow and speckled trout fingerlings, yearlings and older fish was made. Some Kamloops trout, three year old fish were also distributed.

Ova obtained from the hatchery ponds consisted of 633,000 speckled trout and 127,000 rainbow trout.

Two new circular ponds constructed proved most satisfactory as retainers for brood fish.

Live fish of three species, Atlantic salmon, rainbow and speckled trout of different ages from fingerlings to adult fish were shown at the Apple Blossom Carnival, Kentville, at the Nova Scotia Fisheries Exhibition, Lunenburg, and the Nova Scotia Provincial Exhibition, Halifax; also a decorated float was on exhibit at the Natal Day Celebration at Yarmouth, Nova Scotia.

In March 1,000,000 speckled trout eyed eggs were received from Antigonish hatchery. From Miramichi salmon pond 1,000,000 Atlantic salmon green eggs were received in October. In May 35,000 rainbow trout eyed eggs were shipped to Kelly's Pond hatchery. Distributions were: Atlantic salmon 458,050, Kamloops trout 87, rainbow trout 78,800 and speckled trout 992,367; total 1,529,304.

## FLORENCEVILLE HATCHERY

*George Sutherland, Superintendent*

Mr. Murdock McKenzie, Hatchery Assistant at the Florenceville hatchery, was retired on account of age. He was first employed at the Sparkle sub-hatchery in 1914.

An excellent distribution of Atlantic salmon advanced fry, fingerlings and yearlings and speckled trout fingerlings and older fish was made during the summer.

The brood stock developed at this hatchery yielded 2,248,377 speckled trout eggs.

Live fish exhibits of Atlantic salmon and speckled trout of different ages were shown at the Fredericton Exhibition, New Brunswick, and 20 five-year-old and 5 six-year-old speckled trout were displayed at the Sportmen's Show at Boston, Mass.

From February to April 143,653 Atlantic salmon eyed eggs were received from Miramichi hatchery, and in July and August 150,000 Atlantic salmon fingerlings from Grand Falls hatchery the latter for distribution in Skiff lake and Nashwaak river. In the autumn 1,054,550 Atlantic salmon ova were transferred from Saint John salmon pond. Distributions were: Atlantic salmon 1,610,291 and speckled trout 1,538,241; total 3,148,532.

## GRAND FALLS HATCHERY

*W. A. McCluskey, Superintendent*

Operations at the Grand Falls hatchery were most satisfactory. The superintendent is to be commended for the very superior quality of Atlantic salmon fingerlings and speckled trout advanced fry and fingerlings distributed in 1935.

Experimental work proved the feasibility of circular ponds as retainers for brood stock in the future development of the plant.

A most successful collection of 1,006,910 speckled trout ova, which exceeds any former collection, was made at Fraser's pond, Three brooks, in the autumn.

The general appearance of the hatchery and grounds was again a great attraction to visitors and tourists.



In April 300,000 Atlantic salmon eyed eggs were received from Restigouche hatchery. In the autumn 2,036,650 Atlantic salmon ova were transferred from the Saint John salmon pond. In July and August 150,000 Atlantic salmon fingerlings were transferred to Florenceville hatchery. Distributions were: Atlantic salmon 2,086,564 and speckled trout 1,500,512; total 3,587,076.

MIRAMICHI HATCHERY, MIRAMICHI SALMON POND AND BARTIBOG SALMON POND  
*Frank Burgess, Superintendent*

The largest collection in years, viz., 12,028,107 eggs, was made at Miramichi salmon retaining pond during the fall of 1935. While the greater part of this collection, 10,528,107 was laid down in Miramichi hatchery, a shipment of 500,000 was made to Restigouche hatchery and 1,000,000 to Yarmouth hatchery. The first fish was captured on September 9 and the last on September 25. Two thousand five hundred were impounded.

Two hundred and sixty two brood fish were collected at Bartibog salmon pond from May 24 to June 14 inclusive. In spite of considerable loss through an epidemic 177 fish were, on August 31, transferred without loss from Bartibog to Miramichi pond at South Esk. They yielded 901,080 eggs, which were laid down in Miramichi hatchery. Of the 177 there were 146 females and 31 males—that is the ratio of females to males was 82·5 to 17·5.

In addition to Atlantic salmon ova from Miramichi and Bartibog fish, 100,000 speckled trout eyed eggs were received at Miramichi hatchery from Antigonish hatchery in March. Atlantic salmon eyed eggs transferred from February to April were:—to Antigonish hatchery 1,000,000; Florenceville hatchery, 143,653; Lindloff hatchery, 600,000; Middleton hatchery, 600,000 and to Restigouche hatchery, 500,000. Through an exchange agreement with the United States Bureau of Fisheries 1,000,000 Atlantic salmon eyed eggs were shipped to Craig Brook hatchery, Maine. A satisfactory distribution of 3,806,900 Atlantic salmon and 81,318 speckled trout was made; total distribution 3,888,218.

NEW MILLS SALMON POND

*Wm. White, Superintendent*

Three hundred and seventy two fish were purchased for New Mills pond from the commercial fishermen of the district from May 27 to July 27. There was a small loss of 10 fish due to injuries received in the nets, and not detected when the salmon were being placed in the pond. The fish gave an excellent yield of good quality eggs, amounting to 1,771,450 which were laid down in Restigouche hatchery.

NIPISIGUIT SUB-HATCHERY

*J. T. Comeau, Officer in Charge*

This plant was operated quite satisfactorily during the season. Owing to sediment and the contamination of the water supply by drainage from hardwood ashes, manure piles, etc., and also due to the improved highways and transportation facilities which makes it possible to distribute fish from Restigouche hatchery to the Nipisiguit river and other streams in the district, this hatchery was closed at the end of the distribution season of 1935.

In April 479,275 Miramichi river eggs were received via Restigouche hatchery. Distribution was Atlantic salmon 422,084 fry.

## RESTIGOUCHE HATCHERY

*W. A. Mowat and I. A. Mowat, Officers in Charge*

An increased distribution of Atlantic salmon and speckled trout fry and fingerlings was made during the summer.

In March 500,000 Atlantic salmon eyed eggs from Miramichi hatchery and in April 250,000 speckled trout eyed eggs from Antigonish hatchery were received. In the latter month from the Miramichi allotment 479,275 Atlantic salmon eyed eggs were transferred to Nipisiguit sub-hatchery and from the New Mills eggs 300,000 to Grand Falls hatchery. In October and November 1,771,450 salmon ova were received from New Mills pond and 500,000 from Miramichi salmon pond. Distributions were: Atlantic salmon 1,503,180 and speckled trout 225,276; total 1,728,456.

SAINT JOHN HATCHERY, SAINT JOHN SALMON POND AND CHAMCOOK  
COLLECTING STATION*J. D. Nichol, Superintendent*

The following satisfactory collections of eggs at the hatchery ponds were made: Atlantic salmon hybrids 9,135, brown trout hybrids 5,516, landlocked salmon hybrids 7,105, Loch Leven trout 1,580 and speckled trout 1,543,078.

The superintendent and hatchery staff are to be commended for the excellent distribution of fry, fingerlings, yearlings and older fish made from the various species propagated at the hatchery.

In March 30,000 landlocked salmon eyed eggs were forwarded to Middleton hatchery. Nine hundred and thirty speckled trout wild stock were captured in October in Rairdon brook and retained at the hatchery. In the autumn 692,300 Atlantic salmon eggs were received from Saint John pond. Distributions were: Atlantic salmon 755,412, brown trout hybrids 6,010, landlocked salmon 66,567, Loch Leven trout 871 and speckled trout 1,061,545; total 1,890,405.

A tide of 23.2 feet above chart datum is needed to enter the Saint John salmon retaining pond. The higher spring tides flood the marsh and during the ebb carry a considerable amount of what is probably deleterious matter into the pond. In 1934, the maximum temperature of the pond was above 60 degrees F. continuously; the spring tides with two exceptions were above 24 and the population was greatest and contained a considerable proportion of fresh arrivals during the period that the heavy loss occurred. This combination of circumstances suggested the advisability of a change in procedure, such as declining to accept salmon during or immediately preceding periods of high spring tides. Following this procedure 811 salmon were impounded from June 9 to August 10, 1935. The loss was approximately 31 per cent. The percentage loss of salmon during the summer 1935 was as great as when fish were impounded as they were caught. Efforts are now being made to locate a better site and a different method of retention. The salmon stripped yielded 3,783,500 eggs of excellent quality, which were laid down as follows: at Florenceville hatchery, 1,054,550, Grand Falls hatchery 2,036,650 and Saint John hatchery 692,300.

Owing to low water salmon were prevented from ascending to the Chamcook lakes in any number, and as a result no collection of landlocked or sebago salmon was made at this point in 1935.

## KELLY'S POND HATCHERY

*F. C. Hayley, Superintendent*

Heavy losses in fry and fingerlings due to bad water conditions were experienced at Kelly's Pond hatchery in 1935. The Pathologist of the Biological Board attributes these losses which occur the same time each spring to the



growth of algae in the hatchery pond and believes that the variation in severity of loss as between years may be interpreted as a variation in the quantity of algal growth. The pond was treated with copper sulphate in May and again in June in an effort to improve conditions. After the distribution season it was drained and treated with lime to further destroy any growth.

A shipment of 1,250,000 Atlantic salmon eyed eggs was made in February to Bedford hatchery. In May 35,000 rainbow trout eyed eggs were received from Yarmouth hatchery. In October and November 3,516,000 salmon eggs were laid down from Morell salmon pond and in November and December 20,100 speckled trout ova were collected from the hatchery pond, 184,550 from Ings' and 2,000 from Cole's ponds. Distributions were: Atlantic salmon, 729,608, rainbow trout 11,659, and speckled trout 144,878; total 886,145.

#### MORELL RIVER SALMON POND

*A. Tait, Officer in Charge*

The collection of Atlantic salmon eggs at Morell salmon pond exceeded that of any preceding year. Some 1,032 salmon were caught from October 11 to November 18. One night during the season holes were cut in the retaining net and 284 salmon escaped before repairs could be made. The collection amounted to 3,516,000 eggs, which were laid down in Kelly's Pond hatchery.

#### WESTERN DIVISION

DISTRICT SUPERVISOR OF FISH CULTURE, C. W. HARRISON

The return of parent sockeye in 1935 to all districts in which the Department of Fisheries operates fish breeding establishments in the province of British Columbia was, without exception, most gratifying, consequently all stations secured their full quota of eggs.

The following conditions prevailed in connection with the return and escapement of parent sockeye to the different areas where hatcheries are maintained:—

Anderson lake district; the sockeye escapement to the spawning areas of Sproat, Great Central and Anderson lakes was one of the best experienced, notwithstanding the very satisfactory commercial catch secured.

Clayoquot Sound district; the number of sockeye that reached Kennedy lake was unusually large, although the early run did not materialize.

Fraser river system; the supply of parent sockeye that reached the Birkenhead river was the largest for a number of years. These conditions also obtained in the Pitt lake system where the run was the heaviest in the experience of the hatchery staff. At Cultus lake the run was about what was expected and can be considered as reasonably satisfactory.

Skeena river system; although the commercial pack in this system was comparatively small, the escapement of parent sockeye to all parts of this system was fairly heavy, nearly as good as the large run of 1930, and much better than that of 1931. In the Babine area heavy runs occurred in Fifteen Mile creek, Pierre creek, both upper and lower Babine river, and in a lesser degree to Fulton river. There was an excellent run to all tributaries of Lakelse lake, particularly Williams creek, where the return was the largest in years. Unfortunately however, heavy freshets that occurred after the completion of the spawning period practically destroyed all eggs naturally deposited and undoubtedly the return of sockeye to this area in the cycle year of 1939 will depend entirely on the distribution from eyed eggs made from Lakelse Lake hatchery.



A very heavy run of sockeye occurred in Owikeno lake, Rivers Inlet, greater this year than for some time past, notwithstanding an unusually large commercial catch. Consequently all spawning areas were heavily seeded naturally and the hatchery secured a collection of 18,680,090 sockeye eggs.

The total collection of sockeye eggs at all hatcheries in this province was 77,427,774 as against 105,689,080 secured in 1934. This lesser collection is due to the fact that, in accordance with the Biological Board's investigation at Cultus lake, no collection of sockeye eggs at that point was made during the fall of 1935, except an experimental lot of 53,284 which were water hardened and planted in prepared gravel beds in the hatchery creek, Cultus lake, whereas in 1934 the collection in this area was 41,350,240 eggs.

A test was made in 1934-35 of three methods of securing eggs from sockeye salmon. In the expression method the eggs are gently pressed from the ripe female; in the expression and incision method partial expression takes place, the fish is then killed, bled, cut open and the remaining eggs taken out. In the full incision method the fish is killed, bled, cut open and all eggs taken. The loss in incubated eggs using the first method averaged 2.9 per cent; using the second method 5.9 per cent and using the third method 3.3 per cent. The loss in eggs due to opening immature fish in the third method only amounted to 0.8 per cent of total eggs taken by this method.

A collection of spring salmon was made at Cowichan Lake hatchery only, where 277,152 eggs of this variety were laid down. The run of this species to this district was slightly better than an average one. The run of coho was heavy and well above average.

The introduction of brown or Loch Leven trout to the Cowichan and Little Qualicum rivers, Vancouver Island, was continued, and during the year distributions to the waters of the Cowichan lake district totalled 55,409 from the Cowichan lake hatchery, consisting of 26,689 fingerlings and 28,720 yearlings, and from the Qualicum Beach ponds 6,500 yearlings.

Distribution of sporting fish were made in the Little Qualicum river area from the Qualicum Beach ponds of 77,321 brown trout yearlings. At the end of the year there were 49,271 brown trout and 26,632 Kamloops trout fingerlings being retained and fed in the Qualicum Beach ponds under the supervision of employees of the Biological Board.

It is reported that the angling season of 1935 was one of the best in the history of the Banff National Park, Alberta, both from the standpoint of the number of anglers and the number of fish taken. All previously barren lakes lying within the boundaries of the park have been stocked and excellent results are apparent in most instances. Excellent sport was enjoyed in Marvel lake, considerable numbers of rainbow trout up to 3½ pounds in weight having been taken.

After a good many years most promising results are apparent from the introduction of Loch Leven or brown trout into certain Alberta waters, which introduction was undertaken before the natural resources were transferred from the Dominion to the prairie provinces. During the past year brown trout are reported to have been reasonably plentiful and to have provided some good angling in the Red Deer and South Raven rivers, including such tributaries as Grant, Spring, Stauffer creeks, Horseshoe and Rainy lakes and several other waters in the same region.

The Medicine-Maligne system of Jasper Park, which was barren of fish life prior to 1928, continued to afford excellent sport. During 1935, 8,378 speckled trout were taken which weighed 8,798 pounds. The lakes were visited by nearly 1,000 fishermen of whom 640 were non-residents of the province of Alberta.

Excellent results, paralleling the results that were obtained with speckled trout in this system, are apparent in Amethyst lake in the same park. Prior to 1932, Amethyst lake was barren of fish life. It was stocked with kamloops trout and when it was opened to angling in 1935, large numbers of trout weighing up to 3½ pounds were taken. Noted anglers who were at the lake stated that they never found better trout fishing anywhere.

As in previous years the fish cultural staff of the Western Division have given most conscientious, faithful and unsparing service in the execution of their duties.

In Kootenay district, British Columbia, water conditions were such that many fingerlings, yearlings and some old fish became stranded. These were transferred to suitable locations as shown in the following statement:—

Salvaged from	Transferred to	Date	Size	Cut-throat trout	Kamloops trout	Speckled trout
Ben Albe creek, from holes in ditch flowing into	Paddy Ryan lakes.	Oct. 13, 15, 23, 27	3 inches. ....	339	.....	.....
Elk river (near Morrissey), channel off	Elk river.....	Sept. 25. ....	2 inches. ....	225	.....	.....
Goat river, from holes	Goat river.....	Oct. 3. ....	3 inches. ....	50	.....	.....
Inlet creek to Cherry lake, channel creek	Cherry lake....	Sept. 19. ....	1½ inches to 2 inches	350	.....	.....
Little Sheep creek, from holes and channels	Little Sheep creek	July 15, Aug. 14.	2 inches to 5 inches	.....	.....	585
Meadow creek, channels off	Meadow creek..	Sept. 17. ....	2½ inches to 7 inches	.....	.....	104
Michel creek, channel off	Michel creek..	Sept. 24. ....	2½ inches. ....	325	.....	.....
Snake (Boulder) creek	Slocan river at Winlaw and Appledale	Sept. 9. ....	2 inches to 4 inches	.....	464	.....
Third Six Mile lake, outlet	Third Six Mile lake	Sept. 4. ....	2 inches. ....	.....	125	.....
				1,289	589	689

## ALBERTA

### BANFF HATCHERY

*J. E. Martin, Superintendent*

During the past season fish cultural operations carried out at this establishment were eminently satisfactory. Many bodies of water were successfully stocked with sport fish eggs, fry and fingerlings of the different varieties propagated at the plant. Several loans of old fish were made during the year for display purposes.

With exception of 150,400 speckled trout eggs secured from Vermilion lake, the stock distributed were resultant from eyed eggs obtained by purchase from commercial firms, and exchange.

Shipments of eyed eggs received consisted of 491,610 brown trout, 1,038,015 cutthroat trout and 152,250 speckled trout from the Rainbow Ranch, Troy, Montana; 481,840 cutthroat trout and 558,112 rainbow trout from the Crystal Lakes Fish Hatcheries, Fortine, Montana, and 99,000 salmon trout from the Department of Game and Fisheries (via Port Arthur hatchery), Ontario. Kamloops trout eyed eggs were given in exchange for the latter.

The total distribution of all varieties, including fry resultant from eggs received in the fall of 1934, was: cutthroat trout 1,280,360, rainbow trout 447,520, salmon trout 89,445, and speckled trout 847,990, a total of 2,665,315.



It is generally acknowledged that angling in the widespread district served by this hatchery has greatly improved, due to fish cultural operations conducted at this station. Practically all accessible lakes that drain to the Bow river have been stocked with cutthroat trout and there is an annual escape-ment from these lakes to the small tributaries, eventually to the Bow river; consequently sport fishing on that river is reported to have greatly improved.

Due to fish cultural efforts at the Banff hatchery, many other bodies of water have received beneficial attention. For instance the watershed north of the Bow Pass is now well stocked with cutthroat trout and many have been captured weighing up to two pounds. Angling at lake Minnewanka shows great improvement over previous years and practically every tributary to the Elbow and Highwood rivers shows evidence of the successful fish cultural attention given them from this station.

The following waters stocked from this establishment also are reported to have greatly benefited. Baker and Luellen lakes to which distributions were made in 1934 with cutthroat trout fingerlings, contained many four-inch fingerlings in 1935. Upper Kananaskis lake in which 75,000 rainbow trout fry were distributed, from all reports indicate that splendid results have been obtained. Lake Louise, which was stocked with 401 cutthroat trout from Herbert lake, now yields fish from 12 to 20 inches in length. The distribution of cutthroat trout in Egypt and Marvel lakes is also reported to have been successful. In the last two named bodies of water natural reproduction from the original plantings of cutthroat trout fry has increased to such an extent that they are now considerably overstocked and it would seem that there is not sufficient natural food therein to support the present population. Although the smaller fish do not as yet seem to have been affected, the larger fish show a somewhat emaciated appearance.

#### JASPER PARK HATCHERY

A shipment of rainbow trout eyed eggs were received in May from the Crystal Lakes Fish Hatcheries, Fortine, Montana, amounting to 207,320. Out of this lot 157,272 fry were produced and distributed in various lakes and streams in the district.

#### WATERTON LAKES HATCHERY

*G. E. Bailey, Superintendent*

As in the past years, splendid fish cultural service was maintained in 1935 by this establishment. Many lakes and streams have been stocked with game fish with gratifying results and a general improvement in angling over the whole district is reported.

This hatchery depends almost entirely on eggs secured from other sources. This year was no exception to the rule, the following supplies of eyed eggs being received: 200,200 cutthroat trout from the Rainbow Ranch, Troy, Montana, and 395,360 cutthroat trout and 910,100 rainbow trout from the Crystal Lakes Fish Hatcheries, Fortine, Montana. A small collection of 3,300 rainbow trout eggs was made from fish retained in the hatchery ponds.

Distributions for the season were: cutthroat trout advanced fry, fingerlings and yearlings 407,436, and rainbow trout eyed eggs, advanced fry and fingerlings 687,444; a total of 1,094,880.

This hatchery, as well as the Banff hatchery, Alberta, was some years ago transferred to the National Parks branch, Department of the Interior, but continues to be directed by the Department of Fisheries on behalf and at the expense of the National Parks branch.



## FRASER RIVER WATERSHED

## CULTUS LAKE HATCHERY

*A. Robertson, Superintendent*

Following the program arranged by the Biological Board's investigation of the comparative efficacy of artificial and natural propagation, the sockeye eggs retained at the Cultus lake hatchery from the 1934 collection were planted in the eyed stage in tributaries to Cultus lake, Smiths Falls, Spring, Windfall and Watt creeks. The number of eyed eggs distributed was 5,663,880.

As in the preceding year those planted in Spring and Smiths Falls creeks left the gravel satisfactorily, but an unusually dry spell in March and April proved disastrous to the eggs planted in Watt and Windfall creeks and very few, if any, succeeded in reaching the lake. No collection of sockeye eggs, except an experimental group of 53,284 eggs that were water hardened and planted in prepared gravel beds in hatchery creek, Cultus lake, was made from the spawners arriving this year, all fish being allowed to pass through to natural spawning after being counted and tabulated. The run was 5,437 males and 9,917 females, which was poor compared with previous cycles.

To continue a similar experiment conducted in 1934 when severe freshets almost entirely scoured out the plantings, 53,284 sockeye salmon green eggs were collected in November and planted in prepared gravel beds in the small by-pass stream near the hatchery.

In order that certain experiments could be carried out by Dr. Foerster, 50,247 sockeye fry were retained and fed in the hatchery. In July, 47,936 No. 1 fingerlings were released from the lot in Sweltzer creek; 27,000 of them being marked.

The run of steelhead salmon to Sweltzer creek was not as good as the preceding year, a considerable number being spawned out before they reached the traps. A fence was installed at Liumchin creek which operated efficiently. A total collection of 137,400 eggs was made, of which 75,100 were from Sweltzer creek and 62,300 from Liumchin creek. The fry hatch was 69,799 and 57,998, respectively. In addition to the above 21,500 steelhead salmon eggs were taken from the ornamental pool in the centre of the hatchery grounds.

Resultant steelhead fry were fed during the summer and in August 77,000 in fingerling stage were transferred to Smiths Falls hatchery, 500 sold to Messrs. A. E. Wells and Son, Sardis, and the remainder, 63,068, distributed in Sweltzer and Liumchin creeks.

In March, 55,000 sockeye salmon eyed eggs were received from Smiths Falls hatchery. From the cutthroat trout held from 1934, 949 fingerlings eleven months old were transferred to Smiths Falls hatchery in April. On June 27 a shipment of 210,960 cutthroat trout eyed eggs were received from the Crystal Lakes Fish Hatcheries, Fortine, Montana, 100,960 of which were transferred to Smiths Falls hatchery for incubation and retention in ponds; the remainder, after normal losses, were distributed in Atchelitz creek, Little Sumas river, Davis, Echo, Hatzic, Long Island and Popkum lakes. The number of cutthroat trout eyed eggs and fry distributed was 104,401.

The total distribution for all species was 5,932,569. Coho salmon collection during the season amounted to some 420,000 eggs. During the collection of sockeye salmon eggs at Cultus lake in 1934, 50 sockeye caught below the hatchery fence in Sweltzer creek, immediately above its junction with the Vedder river, were marked on October 11 and the same number on October 15, by removing the outer half of the dorsal fin. At the same time a gill net was set in Vedder pool where sockeye had been seen and kept there from October 11 to 16. In this time it caught 4 unmarked and one marked male

sockeye, the latter on October 13. A similar net was set a mile and a half farther up stream on October 13 and 15. No sockeye were taken in it. In addition to the marked sockeye actually captured in the Vedder above its confluence with the creek, at least one additional male and one female were observed there on October 16 and 18. On October 18, also 10 marked males were observed in the Vedder below the confluence.

These experiments definitely established that many of the sockeye which had gone up to the traps had returned down Sweltzer creek, a distance of 1,050 yards, and that some of them had ascended the alternative stream for 450 yards. All sockeye of the Cultus lake run were retained in 1934 for use in artificial propagation. All of the 100 sockeye that were marked and liberated below the fence were recovered again in Sweltzer creek, except the one which had been caught in the river. After leaving the stream for the river, sooner or later all had again entered the parent stream, that is Sweltzer creek, and none had ascended the Vedder permanently.

These observations indicate that migrating adult sockeye salmon meeting an obstruction in the parent stream returned down stream to a larger river and some of them ascended it for a considerable distance, but that all of the 100 marked fish in this instance eventually returned to the parent stream after various absences up to three weeks.

Work of special nature undertaken and completed in connection with this establishment consisted of the construction of a cement dam at the settling pond, eight new hatching troughs, and the enlarging of the retaining pond at Sweltzer creek. Improvements to the hatchery grounds were also made.

#### SMITHS FALLS HATCHERY

This establishment was taken over from the Biological Board on March 31, previous to which, on March 6 and 13, 4,255,862 sockeye salmon eyed eggs were transferred to Pitt lake hatchery, and on March 18, 55,000 to Cultus lake hatchery, these being eggs from the Cultus lake 1934 collection.

Shortly after the transfer of this station to the fish cultural branch of the Department, 949 cutthroat trout eleven months old fish that had been retained and fed at Cultus lake hatchery were placed in the Smiths Falls ponds with some 4,932 cutthroat that were in the ponds. Of these fish some 5,816 cutthroat ranging from five to nine and a half inches in length were on hand at the end of the year.

In June, 100,960 cutthroat trout eyed eggs, a part of a shipment received at Cultus lake hatchery from the Crystal Lakes Fish Hatcheries, Fortine, Montana, were transferred to this station, hatched, retained and fed in troughs, and later transferred to one of the large ponds. A fairly heavy loss occurred during and immediately following hatching, but after the food sac was absorbed the fry commenced to make satisfactory progress. At the end of the year there were some 73,308 cutthroat strong healthy fingerlings, ranging from two and one-eighth to nine and one-eighth inches in length.

From Lloyd's creek hatchery 50,000 Kamloops trout eyed eggs were received, the resultant fry from which, 43,706, were liberated in Devil, Grace and Wolf lakes.

Seventy-seven thousand individually counted and selected steelhead salmon fingerlings were transferred from Cultus lake hatchery and placed in the ponds in August. Soon after the transfer of these fish they contracted a disease diagnosed as "popeye" and 4,000 died before it ceased.

Distributions were: Kamloops trout fry 43,706 and sockeye salmon eyed eggs and fingerlings 103,551, which totals 147,257.

Owing to the necessity for economy a straight diet of salmon meat instead of liver was used for fry food, and as far as can be seen at present it has proved quite satisfactory.



## PEMBERTON HATCHERY

*T. W. Graham, Superintendent*

The distribution of sockeye fry resultant from the 1934 collection commenced on March 16, 1935, and continued until June 1, by which time 19,309,300 fry had been liberated in the usual way by allowing them to leave the troughs when so inclined and pass through a series of small natural ponds to the Birkenhead river, the parent stream.

In June, 155,000 Kamloops trout eyed eggs were received from Lloyd's creek station, from which 90,000 eyed eggs were distributed in Lac La Hache, McLeese, Horse, Millburn and Ten Mile lakes, and 64,700 fry in Alta and Lost lakes. The total distribution for the season was 19,464,000.

Kamloops trout are reported to be thriving in Tenquille, Ogre and Owl creek lakes. These lakes were barren previous to plantings from Pemberton hatchery.

The run of parent sockeye to the Birkenhead river in the fall of 1935 is stated to be the best since 1932, so that besides 24,410,000 eggs secured for fish cultural purposes, there was a good natural spawning covering well the area below the fence and for several miles above it.

All the artificial spawning was done by the incision method and the eggs secured are considered by the superintendent to be the best ever handled.

In January a long cold spell followed by a sudden change to heavy warm rains caused a quick rise in the water of the Birkenhead river, broke up the ice and caused a jam against the piers of the spawning fence, exerting enough force to tear away the trestles and upper structure. The work of repairs was mainly done by the hatchery staff at small cost.

## HARRISON LAKE HATCHERY

*C. R. T. Hearn, Superintendent*

At the commencement of the calendar year 1935 there were 29,278,693 sockeye salmon eggs in the hatchery, being eggs received from the 1934 collection at Cultus lake, from which 11,618,840 eyed eggs and 13,794,612 fry were distributed in the tributaries of Harrison river and lake.

An abnormal loss of fry in the hatchery was experienced during May 3 to 10, which came on suddenly and caused sufficient anxiety that a special investigation of conditions was made by Dr. W. E. Ricker of the Biological Board, Mr. H. J. Horn of the Department of Bacteriology of the University of British Columbia and Mr. C. W. Harrison, District Supervisor of Fish Culture for British Columbia. The fry appeared ill at ease, swam erratically about and acted in an unusual manner, most of the mortality occurring during night time. The report of the pathologist showed that the alevins had no bacterial disease, and though no definite cause of loss was established it is generally considered that it was due to some chemical contamination in the water causing lack of oxygen. The water tasted earthy and had a faint fungaceous odour. There was also a covering of a grayish white substance about one-sixteenth of an inch in thickness on the sides of the troughs. Immediate steps were taken to aerate the water supply by installing riffles wherever possible and a pronounced decrease in mortality was evident the following day, May 5, and a continuous improvement was noted from then on. It is expected that the deleterious condition of the water may have been due to an abnormal lowering of the level of Trout lake from which the supply of water for the hatchery is obtained. A long period of severe frosty weather was experienced and during that time the Harrison Hot Springs Hotel and the Harrison lake hatchery were steadily lowering Trout lake, whilst owing to ice-bound conditions no fresh water was entering. This



evidently led to a drawing off of a lower level which is practically stagnant and which with the effect of higher temperatures caused excessive organic decomposition.

An inspection was made of a number of the egg plantings made from this hatchery this year and in every instance there was evidence of excellent production of strong healthy fry.

The buildings at this establishment are in poor state of repair, as only emergency repairs sufficient for actual operation were carried out to make this hatchery available for care of the surplus sockeye eggs collected at Sweltzer creek, Cultus lake, which eggs had to be transferred to conform with the requirements of the Biological investigation in progress at Cultus lake.

#### PITT LAKE HATCHERY

*R. H. Eaton, Superintendent*

In March, a shipment of 4,255,862 sockeye salmon eyed eggs were received from Smiths Falls hatchery. Of these 1,350,000 eyed eggs were distributed in Four and Seven Mile creeks, soon after arrival, and the balance were incubated and held to the fry stage; 2,897,235 fry being liberated. Of the 719,804 fry held from the 1934 collection at Pitt lake, 659,705 were distributed as fry and 59,944 after retention in ponds as No. 2 fingerlings.

An unexpectedly large run of sockeye salmon arrived at the Pitt lake spawning grounds in 1935. This has been stated to be the greatest in the memory of the oldest employee, who has been at the hatchery since 1924.

The river was high, making the capture of fish difficult and it is estimated that fifty fish to every one spawned by the operators were left to spawn naturally. The collection of sockeye eggs this season, amounted to 3,880,000 of which of 830,000 eggs were planted in gravel to allow sufficient room in the hatchery for fry and the remainder of the eggs.

Some 826 Kamloops trout which were retained in the ponds from the 1934 shipment received from Penask lake hatchery were released in the No. 5 fingerling stage in Four Mile creek. The total distribution for the season was 5,797,710. Angling for sport fish is reported to have greatly improved, owing to the introduction of Kamloops trout in recent years by the fish cultural branch of this Department.

#### VANCOUVER ISLAND

##### ANDERSON LAKE HATCHERY

*D. Bothwell, Superintendent*

Distributions of sockeye eyed eggs and fry and spring salmon fry and fingerlings resultant from the 1934 collection were successfully made. The sockeye distribution consisted of 1,472,440 eyed eggs which were planted in gravel in Clemens creek and 4,897,121 fry planted in tributaries of Anderson lake. The spring salmon distribution consisted of 92,903 fry and 23,915 No. 3 fingerlings all of which were liberated in Anderson river; a total distribution of 6,486,379.

During the period of January 15 to 20, 316,435 spring salmon eyed eggs from the 1934 collection at Sproat river were distributed in the Stamp river.

The spring salmon fingerlings held in tanks at this hatchery and fed from April 21 to August 1 were liberated unmarked after the supply of fish food available had been exhausted; a liberation of 23,916 being made from 25,000 originally retained.

Owing to shortage of funds for fish culture, the collection of eggs this year was confined at this establishment to the sockeye species and to the quantity which the hatchery could handle when hatched. A total of 5,292,000 sockeye

eggs were obtained all by the incision method; 1,445 females and 1,441 males being used in the operation.

The estimated number of sockeye parent fish to reach the spawning area was 45,000, which, after deducting the number used in artificial propagation, would leave 42,114 to spawn naturally; a heavy seeding which coincided with very favourable conditions as there were no bad freshets in the creeks.

The estimated run was three times as large as the estimated run of 1934 and compares very favourably with the brood year of 1931.

Out of the 1,445 females used in the full incision method, only 26 were killed from which all the eggs could not be taken. A liberal estimate of loss of 600 eggs to each of these 26 fish gives a total loss of 15,600 eggs, which is relatively small from a collection of 5,292,000 ova.

The following special work was done at this establishment during the year: Rearing tanks were caulked and disinfected. Decayed wall of superintendent's residence was repaired, new sills were placed under the building and it was given a coat of paint. An office was installed in the messhouse. A new foot bridge was built over Ternan creek and considerable improvements were made to the hatchery grounds and seining beaches.

#### KENNEDY LAKE HATCHERY

*W. P. Forsythe, Superintendent*

From the collection of 8,897,300 sockeye salmon eggs in 1934, a distribution of 8,562,599 eyed eggs, fry and fingerlings was made, consisting of 1,947,455 eyed eggs, 1,880,000 advanced fry, 3,591,388 No. 1 fingerlings, 1,024,790 No. 2 fingerlings, 99,130 No. 3 fingerlings and 19,836 No. 4 fingerlings, which were liberated in different places of Kennedy river and lake and Muriel lake.

The collection in 1934 was taken from the late run in October and November, 3,479,250 by expression, 1,638,500 by incision after expression and 3,779,550 by full incision.

The total losses during the egg period, including a loss of 8,965 eggs in 30,000 green eggs planted in a prepared gravel hatching bed, was 329,822 or 3.7 per cent. The heaviest loss occurred in the eggs taken by incision-after-expression method which was 9.5 per cent. Loss in eggs taken by expression was approximately 2 per cent and by full incision 2.4 per cent.

All fry were retained a period in the ponds before release from about a week to ten days. The losses of weak fry in the hatching troughs was 4,040. In all 6,615,823 fry were transferred to the ponds as they reached the free swimming stage, for feeding and development before liberation. The loss while in the ponds was 679, leaving 6,615,144 for distribution.

The food used in the early stages was herring and salmon egg meal and in the fingerling stages cooked fresh crab meat. Fifteen ponds were operated during the season.

The taking of spawn for 1935 commenced on October 29 and finished on November 22, by which time 9,053,000 sockeye salmon eggs had been taken. There was no early run of sockeye this year, as this variety follows the four year cycle very closely and on two years of the cycle none may be expected. On the third year there is a small run of a few hundreds and every fourth year a large run. The next big year is expected in 1937.

The 1935 collection was taken from 2,520 females and 2,843 males or less than two-thirds of those available; all eggs obtained being by the full incision method. The average number per female stripped was 3,592, being the highest average to date at this hatchery. The losses to December 31 with the eggs well eyed was slightly over 1 per cent.

At the end of the 1935 collection a group of selected extra large sockeye, male and female, were taken and stripped separately, the experiment being



to compare the progeny with those of an ordinary run. Eight females were stripped yielding 31,600 eggs averaging 6,320 to the quart as against the ordinary run of 7,675.

The run to Muriel lake was estimated at over one thousand fish, approximately one-third females, and it was considered that these fish were the returns from half a million Kennedy lake eggs of the 1931 collection planted in the spring of 1932 as there was no natural spawning in Muriel lake in the fall of 1931. This return is a great advance on the returns in 1933 from the 1929 seeding when only 500 fish were estimated from a seeding of three million eggs. From this experience and a study of the spawning beaches, it is considered that by judicious fish cultural operations, a run of considerable importance to the district can be developed in this body of water.

An experiment in planting and incubation of green sockeye eggs was carried out. Two lots of 30,000 eggs were used, the first lot being planted after two and a half hours water hardening and the second was cared for in the hatchery troughs. The first lot gave 21,035 free swimming fry or 70.1 per cent and the second, after deducting a loss of 54 fry before the free swimming stage, yielded 28,544 free swimming fry or 95 per cent.

The superintendent places the high loss in the planted eggs to the silting of the gravel during freshets and to insufficient circulation in the upper end of the planting ground. These conditions will be guarded against in the continuation of the experiment.

A quantity of crabs were secured from Tofino Inlet and after cooking for twenty minutes were used for fry feed. The fry appeared very keen for this food, but not having any other food on hand, no comparative tests could be made.

The run of parent sockeye to this system was estimated at from thirty-five to forty thousand fish which shows a steady increase in this variety in the last five years. Coho and spring salmon runs were on an average with the past four years.

A small lake tributary to Clayoquot Arm of Kennedy lake was discovered and named Elbow lake. This lake has an area of  $8\frac{1}{2}$  acres, an abundant supply of natural food for fry and it is proposed to plant 50,000 sockeye eggs therein during the coming distribution season.

#### COWICHAN LAKE HATCHERY

*J. H. Castley and F. A. Tingley, Superintendents*

On March 31, 1935, this hatchery was placed entirely under the management of the officers of the Biological Board to become a part of the sport fish research work being carried on by the Board and an officer of the Department's fish cultural branch was transferred to this station to superintend the hatchery and collections under the direction of the Biological officers.

The following is a synopsis of the Superintendent's report: Distributions during the year amounted to 1,479,257—Atlantic salmon yearlings 4,803; brown trout fingerlings 26,689 and yearlings 28,720; coho salmon eyed eggs 200,000 and fry 490,673; spring salmon eyed eggs 75,000, fry 255,736 and fingerlings 263,977; steelhead salmon fingerlings 66,382. In June 67,277 brown trout fingerlings, resultant from the shipment of eggs received from the Rainbow Ranch, Troy, Montana, were transferred to the Qualicum Beach ponds.

The pond rearing operations were conducted by Mr. S. E. Deno who has had considerable experience in rearing of fish with the Biological Board. In May 105,900 spring salmon free swimming fry were placed in the earth ponds, of which 76,817 were later released directly into the Cowichan river and the balance 26,499 were transferred to the wooden ponds on June 4. None of the above were actually counted but were calculated by weight. On July 26, 12,500 were released owing to shortage of water averaging  $2\frac{3}{4}$  inches in length



and on July 30 a remaining 15,400 were liberated averaging  $3\frac{1}{8}$  inches in length. These latter fish were hand counted and showed a surplus of 2,223 fingerlings above the number arrived at by weight.

Oliver creek ponds were stocked with 159,890 spring salmon free swimming fry but were released after less than a month, owing to the shortage of water. The loss for this group was 630.

In these two series of ponds 162 pounds of canned salmon,  $44\frac{1}{2}$  pounds of dried buttermilk and  $7\frac{1}{2}$  pounds of fish meal were used as food.

Brown trout numbering 190,707 were taken over for feeding on April 21. Heavy losses resulted from fungus disease and 12,642 were lost from a water supply tap failing during the night; a shipment of 67,277 to the Qualicum Beach ponds, left a remainder that were transferred to wooden ponds near the hatchery. These were hand counted and released in Cowichan river in September. The count was 26,689, which shows a discrepancy of 8,676 between the total recorded on April 21 and subsequent losses and distributions.

Of the steelhead salmon fry, 66,838 were taken over for pond rearing in June. From these 34,721 fingerlings were released in Cowichan river and the remainder 31,661 were transferred to the Provincial Game Board's ponds at Veitch creek for rearing and later distribution.

An experiment was carried out in an attempt to hold spring salmon females to ripen in pens larger than the usual small enclosures but no satisfactory results were obtained, as only two fish out of twenty-seven became completely ripe. The majority died without any apparent development of the eggs.

Experiments were made in transporting eggs and milt in sealed containers but the results failed to indicate any improvement on the customary method of transporting green salmon eggs.

A fish weir was constructed in July across the Cowichan river and two traps installed, one with an upstream intake and the other with a down stream intake, in order to make observations on the movement of spring salmon. Freshet conditions on October 23 necessitated removal of panels. A number of spring and six sockeye salmon were observed, besides trout of all varieties passing up and down stream. A large run of coho passed up stream just before the fence was abandoned.

The collection of eggs from the Cowichan river during the season consisted of: spring salmon 277,152 and steelhead salmon 78,000.

The superintendent's residence was completely renovated during the year and the living quarters of the assistant were enlarged. A new boat house was also built to replace the one that collapsed owing to the heavy snowfall the previous year.

#### SKREENA RIVER WATERSHED BABINE LAKE HATCHERY

*A. P. Hills and W. R. Reid, Officers in Charge*

The distribution of sockeye salmon fry and fingerlings resultant from the 1934 collection was successfully accomplished, and consisted of 3,748,873 fry and 879,945 No. 1 fingerlings.

The run of parent sockeye last season to Morrison creek on which this hatchery is located, was similar to those of the last four years, consequently it was necessary to make collections at Babine river, in order that a full complement of eggs might be secured.

A collection of 3,960,000 sockeye eggs was made at Morrison creek and 3,840,000 at Babine river, making a total collection of 7,800,000. An unusual feature of the Babine lake run of sockeye in 1935, to the two mentioned spawning areas, was the great predominance in the number of males over females. It is estimated that there were fifteen to twenty males to every female.

All eggs secured in 1935 were taken by the incision method and it would seem that the results secured amply justify this system of stripping as at the end of the year the loss sustained was only 1.47 per cent as against approximately 3.5 per cent in other years when the full expression and expression followed by incision were the methods practised.

In addition to the distribution from the 1934 collection, 1,546,030 sockeye eyed eggs from the 1935 collection were planted in a specially made channel in Morrison creek in November. Subsequently the plantings were examined and the fry were found in good condition and there were no indications of any loss as no bad eggs were noted.

Special work undertaken during the year consisted of: Interior of mess house repainted. A new sixty foot wharf built on Morrison lake. A new storehouse 10 feet by 12 feet and a new meat house 8 feet by 10 feet built. Engine bed and Easthope engine installed in the hatchery boat. New channel excavated in Morrison creek to relieve high water conditions and prevent the flooding of the hatchery grounds.

#### LAKELSE LAKE HATCHERY

*C. R. T. Hearn, Superintendent*

The distribution of sockeye resultant from the 1934 collection was carried out under most favourable climatic and water conditions. The number of fry produced and distributed in the main spawning tributaries and suitable bays of Lakelse lake was 7,625,460, also 168 No. 5 fingerlings were liberated from the small retaining tank in the hatchery on March 25. It is reasonable to anticipate that the migration of yearlings from Lakelse lake should be all that is desired.

Spawning operations commenced on August 6 continuing until August 25, when a total collection of 8,259,400 sockeye salmon eggs had been obtained as follows, from Granite creek 317,200, Salmon creek 134,200, Scullabuchan creek 1,390,800 and Williams creek 6,417,200. Both runs to Scullabuchan and Williams creeks were larger than had been seen for years and thousands of fish ascended these streams after spawning operations ceased. A very heavy migration of fry would have been expected had it not been for an abnormal freshet that occurred.

From October 24 to 29 the heaviest rainfall in the memory of the oldest residents in the district took place. This caused such severe freshets that the water supply to the hatchery was disrupted by a stoppage in the pipe-line on the night of October 26. Two minor stoppages were cleared but a third could not be located or cleared. This seriously endangered the contents of the hatchery and it was decided, in order to save the eggs, to plant in gravel the full complement held. This was accomplished by taking on extra help and working at high pressure for the eggs had been without the usual supply of water for seven days before operations could be commenced. It was sixteen days before all were planted in Eliza, Granite, Salmon, Scullabuchan and Williams creeks, numbering 7,943,905 eyed eggs.

Whilst carrying out these planting operations it was observed that the loss of the natural spawn, due to the terrific freshets, was practically 100 per cent. It was estimated from actual count that during the whole of the planting operations not more than twenty live eggs were encountered, whereas smothered eggs by the thousands were displaced. Whatever return there is to this lake in the cycle year may be concluded to have come from the seeding carried out by this hatchery.

Following the completion of planting operations the staff of the hatchery was transferred to other points, the hatchery closed down and a caretaker left in charge.



## MAINLAND WEST COAST RIVERS INLET HATCHERY

*F. A. Tingley and C. R. T. Hearn, Superintendents*

The season's distribution resultant from sockeye and spring salmon ova from the 1934 collections consisted of: sockeye eyed eggs 3,111,000 and fry 7,945,183, spring salmon fry 318,140 and No. 1 fingerlings 59,861. A further distribution of 302,778 sockeye eyed eggs was made from the fall collection of 1935, the whole being liberated or planted under very favourable conditions in selected suitable areas of Owikeno lake and its tributaries. The total distribution was 11,736,962.

An unusually heavy return of sockeye salmon to Owikeno lake area occurred this season and no difficulty was encountered in securing a total of 18,680,090 eggs, which were taken between October 1 and 26. Out of this number it is proposed to plant approximately ten million eyed eggs and thus permit the hatchery contents to be reduced to its recognized fry carrying capacity.

## SPORT FISH OPERATIONS-SOUTHERN INTERIOR NELSON HATCHERY

*H. C. Crawford, P. B. Stratton and A. P. Hills, Officers in Charge*

The total number of eyed eggs, fry and fingerlings distributed from this station during the year was 1,373,965, consisting of Kamloops trout, 287,923 eyed eggs, 230,548 fry and 85 No. 5 fingerlings; Kennerly's salmon, 375,000 eyed eggs and 336,870 fry; speckled trout 95,000 eyed eggs and 240,539 fry.

A small retaining tank was operated inside the hatchery and 85 Kamloops trout fingerlings, two inches in length, were distributed in West Arm of Kootenay lake on April 4.

Local collections consisted of 303,400 Kamloops trout eggs, 143,500 from Cottonwood lake and 159,900 from Six Mile lake; 1,000,000 Kennerly's salmon eggs from Kokanee creek, and 281,280 speckled trout eggs from Violin lake. The collection at Violin lake was hampered by exceptionally cold weather, making it necessary to abandon operations finally when the lake completely froze over. The Trail Rod and Gun Club, interested in the speckled trout taken for fish cultural purposes at Violin lake, British Columbia, transferred at the expense of the club some 1,546 females and 1,149 males to Beaver creek.

The hatchery received a shipment of 260,000 Kamloops trout from Penask lake hatchery and 100,000 eyed eggs additional which were later transferred to Argenta hatchery.

Excellent fishing is reported in the following lakes and streams stocked from the Nelson hatchery: Inonoaklin river (above falls), Wilson creek (above falls), Beatrice, Boundary, Kimball, Leviathan, Lime, Loon, McGregor, Ross, Tanal, Wheeler and Wilson lakes. These were barren of fish previous to stocking by the Department. Angling is reported to have improved in Kootenay river and lake, and generally throughout the district.

During the year ten new hatching troughs were constructed. A small cabin was also built at Six Mile lake for storing fences and equipment.

## ARGENTA HATCHERY

*A. P. Hills, Superintendent*

This sub-station was operated on the same site as in 1934, and consists of a small outdoor hatching station of a temporary nature for the propagation of eggs and fry for distribution to the upper portions of Kootenay lake.

Two shipments, totalling 500,000 Kamloops trout eyed eggs were received from Penask lake hatchery. The resultant fry, amounting to 468,800, were distributed in Argenta slough, Big slough, Schroeder bay, and west shore of Kootenay lake.



Improved angling is reported in the upper end of Kootenay lake.

The staff at the hatchery established a water gauge on the supply creek in order to ascertain the minimum flow of water during the dry season. Satisfactory measurements were recorded and there appears to be no doubt but that this creek has sufficient flow throughout the year to maintain an adequate supply for a fair sized hatchery.

#### PENASK LAKE HATCHERY

*R. H. Eaton, Superintendent*

Unfavourable climatic conditions hampered the work of taking eggs at this station in 1935. A very heavy snowfall and late spring made a high run off in Penask creek, which caused considerable trouble at the fences, so that in an endeavour to get as large a collection as possible collecting operations were also carried out at Spahomin creek at the outlet of Penask lake.

The total collection amounted to 2,630,000 Kamloops trout eggs, of which 1,730,000 were taken from Penask creek and 900,000 from Spahomin creek.

Eyed eggs were shipped to the following hatcheries: Argenta, 500,000; Cranbrook, 141,000; Nelson, 260,000; and Summerland, 1,348,193.

The stocking of barren lakes in this district has been showing very satisfactory results. Fish up to 6½ pounds are being taken in Neveu, Jackson, Cowan and Peterson lakes, and in Peter Hope lake, which was stocked in 1932, 10-pound fish are common, whilst one reported weighed 17½ pounds.

Owing to the difficulty in holding the fish at the fences in Penask creek in the past, the upper and lower fences were replaced with new fences of wider construction, with more adequate protection against scour, which will no doubt enable this station to make a bigger collection than was done this season, owing to the escapement of fish around the fences during the high water that was experienced. Distribution of Kamloops trout for the season was 151,000 eyed eggs and 257,902 fry; a total of 408,902. The staff and members of the Penask lake club gave every possible assistance to the operations at this hatchery.

#### SUMMERLAND HATCHERY

*G. N. Gartrell and R. H. Eaton, Officers in Charge*

This station of the Okanagan and Nicola district was again used this year for distributing Kamloops trout. A shipment of 1,348,193 Kamloops trout eyed eggs was received from Penask lake hatchery, resultant from which 698,193 eyed eggs and 629,379 fry were distributed in twenty-eight different lakes and streams in the district.

Good reports have been received from the Kelowna and Princeton Rod and Gun Clubs concerning the fry in their ponds. The clubs were well pleased with the fry allotted to them.

The water supply for the hatchery was this year changed to connect with the municipal water service of the village of Summerland. No trouble was experienced with the quality of the supply.

#### LLOYD'S CREEK HATCHERY

*A. P. Hills, Superintendent*

The collection of Kamloops trout eggs amounted to 3,072,250 or nearly 600,000 more than in 1934. The following is the yield of eggs from the different waters: Fish lake, 1,524,250; Knouff lake, 513,000; Paul creek, 388,000; and Pinantan creek, 647,000.

The run of parent fish to the spawning grounds compared favourably with previous years. At Knouff lake, through improvements made in the trap, a

larger collection was made than in 1934. At Pinantan lake the collection was approximately the same as the previous year. At Fish lake, owing to favourable water conditions, the amount collected was fifty per cent greater than in 1934. At Paul creek the number taken was less than half of the previous year, although it is believed that as many parent fish as usual were passed over the counting fence, operated by the Biological Board.

Distributions consisted of 1,375,500 eyed eggs and 910,675 fry, making a total of 2,286,175. The above includes allotments of 100,000 eyed eggs to the Revelstoke Rod and Gun Club, Biological Station, Taft, and 500 eyed eggs to Mr. Oliver Wells, Sardis. Through an exchange agreement with the Provincial Department of Game and Fisheries, Ontario, 100,000 Kamloops eyed eggs were sent their hatchery at Sault Ste. Marie. Pemberton hatchery received 155,000; Smiths Falls hatchery 50,000 and the Provincial Game Board, Stanley Park, 325,000.

Very favourable reports have been received by the Department that angling throughout the district has been the best this season that has been experienced, which speaks well for the fish cultural operations conducted here in the past.

#### BEAVER LAKE EYEING STATION

*W. L. Goodlet, Officer in Charge*

Kamloops trout eggs were again collected this season, but owing to no satisfactory arrangement having been arrived at for the establishment of a permanent hatchery, the development of eggs to the eyed stage and hatching of fry was carried out as in previous years in temporary troughs at Echo creek and below the storage dam at Beaver lake. Extreme high water in this creek endangered the season's operations and some eggs were lost from the lower troughs in Echo creek by wash out. The water supply at this point is neither safe nor dependable, but is the best obtainable in the locality under the present conditions.

A collection of 960,000 Kamloops trout eggs was made at this point, from which 550,000 eyed eggs and 330,185 fry were distributed. The distributions were all made in the district, 150,000 eyed eggs to the Kelowna Rod and Gun Club, 30,000 fry to the Vernon Angling Club, and the balance to Beaver lake and other bodies of water tributary thereto.

In order to get the best results from fish cultural operations a fully equipped hatchery with adequate water supply is necessary. The Angling association of Kelowna have been enthusiastic in regard to the benefit derived in the district from the operations carried out in the past, as not only has Beaver lake been made a prominent fishing centre which was barren of fish life prior to 1926, but numerous waters have been stocked enhancing the sport fishing opportunities of the locality generally.

#### QUEEN CHARLOTTE ISLANDS

TL'ELL RIVER—McCLINTON CREEK

*E. V. Epps, Officer in Charge*

Similar operations as in the fall of 1933 were conducted this season at Tl'ell river flowing into Hecate straits. A good run of pink salmon reached the fence in Tl'ell river and a collection of 620,000 eggs was made between September 3 and 11. These eggs were laid down in McClinton creek hatchery.



## STATEMENT, BY SPECIES, OF LOCAL COLLECTIONS AND DISPOSAL OF EGGS DURING 1935

Species	Collection area	Number collected	Disposal	Number	Totals
Atlantic salmon.....	Margaree pond, N.S.....	5,450,000	Margaree hatchery.....	5,450,000	
	Nictaux pond, N.S.....	679,200	Middleton hatchery.....	679,200	
	River Philip, N.S.....	4,573,100	Bedford hatchery.....	2,868,000	
			Middleton hatchery.....	1,705,100	
	Sackville river, N.S.....	806,400	Bedford hatchery.....	806,400	
	Baribog pond, N.B.....	901,080	Miramichi hatchery.....	901,080	
	Miramichi pond, N.B.....	12,028,107	Miramichi hatchery.....	10,528,107	
			Restigouche hatchery.....	500,000	
	New Mills pond, N.B.....	1,771,450	Yarmouth hatchery.....	1,000,000	
	Saint John pond, N.B.....	3,783,500	Restigouche hatchery.....	1,771,450	
			Florenceville hatchery.....	1,054,550	
			Grand Falls hatchery.....	2,036,650	
			Saint John hatchery.....	692,300	
Morell river, P.E.I.....		3,516,000	Kelly's Pond hatchery.....	3,516,000	33,508,837
Atlantic salmon (hybrid)...	Saint John hatchery ponds, N.B.....	9,135	Saint John hatchery.....	9,135	9,135
Brown trout (hybrid).....	Saint John hatchery ponds, N.B.....	5,516	Saint John hatchery.....	5,516	5,516
Coho salmon.....	Cowichan river, B.C.....	420,000	Cowichan lake hatchery.....	420,000	420,000
Cutthroat trout.....	Cultus lake hatchery, fountain pond, B.C.....	21,500	Cultus lake hatchery.....	21,500	21,500
Kamloops trout.....	Beaver creek, B.C.....	465,000	Beaver lake eyeing station.....	465,000	
	Crooked creek, Beaver lake, B.C.....	200,000	Beaver lake eyeing station.....	200,000	
	Echo creek, Beaver lake, B.C.....	295,000	Beaver lake eyeing station.....	295,000	
	Fish lake, Kamloops, B.C.....	1,524,250	Lloyd's creek hatchery.....	1,524,250	
	Knouff lake, Kamloops, B.C.....	513,000	Lloyd's creek hatchery.....	513,000	
	Paul creek, Kamloops, B.C.....	388,000	Lloyd's creek hatchery.....	388,000	
	Pinantan creek, Kamloops, B.C.....	647,000	Lloyd's creek hatchery.....	647,000	
	Cottonwood lake, Nelson, B.C.....	143,500	Nelson hatchery.....	143,500	
	Six Mile lake, Nelson, B.C.....	159,900	Nelson hatchery.....	159,900	
	Penask creek, Nicola Valley, B.C.....	1,730,000	Penask lake hatchery.....	1,730,000	
	Spahomin creek, Nicola Valley, B.C.....	900,000	Penask lake hatchery.....	900,000	
	Kokanee creek, B.C.....	1,000,000	Nelson hatchery.....	1,000,000	
	Grand lake, N.S.....	27,000	Bedford hatchery.....	27,000	
Kennerly's salmon.....	Saint John hatchery ponds, N.B.....	7,105	Saint John hatchery.....	7,105	6,965,650
Landlocked salmon (hybrid)...	Saint John hatchery ponds, N.B.....	1,580	Saint John hatchery.....	1,580	1,000,000
Loch Leven trout.....	Tell river, Queen Charlotte Islands, B.C.....	620,000	McClinton creek hatchery (Biological board).....	620,000	27,000
Pink salmon.....		109,000	Antigonish hatchery.....	109,000	1,580
	Antigonish hatchery ponds, N.S.....	127,000	Yarmouth hatchery.....	127,000	620,000
Rainbow trout.....	Waterton lakes hatchery pond, Alta.....	3,300	Waterton lakes hatchery.....	3,300	
	Anderson lake, B.C.....	5,292,000	Anderson lake hatchery.....	5,292,000	239,300
Sockeye salmon.....	Babine river, B.C.....	3,840,000	Babine lake hatchery.....	3,840,000	
	Morrison creek, Babine lake, B.C.....	3,960,000	Babine lake hatchery.....	3,960,000	
	Sweltzer creek, Cultus lake, B.C.....	53,284	Cultus lake hatchery.....	53,284	



Species	Collection area	Number collected	Disposal	Number	Totals
Speckled trout.	Clayoquot Arm, Kennedy lake, B.C.	9,053,000	Kennedy lake hatchery.	9,053,000	
	Granite creek, Lakelse lake, B.C.	317,200	Lakelse lake hatchery.	317,200	
	Salmon creek, Lakelse lake, B.C.	134,200	Lakelse lake hatchery.	134,200	
	Seullabuchan creek, Lakelse lake, B.C.	1,390,800	Lakelse lake hatchery.	1,390,800	
	Williams creek, Lakelse lake, B.C.	6,417,200	Lakelse lake hatchery.	6,417,200	
	Birkenhead river, B.C.	24,410,000	Pemberton hatchery.	24,410,000	
	Boise creek, Pitt river, B.C.	710,000	Pitt lake hatchery.	710,000	
	Coxe's slough, Pitt river, B.C.	345,000	Pitt lake hatchery.	345,000	
	Four Mile creek, Pitt river, B.C.	1,060,000	Pitt lake hatchery.	1,060,000	
	Mountain slough, Pitt river, B.C.	760,000	Pitt lake hatchery.	760,000	
	Peter's slough, Pitt river, B.C.	555,000	Pitt lake hatchery.	555,000	
	Seven Mile creek, Pitt river, B.C.	450,000	Pitt lake hatchery.	450,000	
	Genesi creek, Owikeno lake, B.C.	6,820,264	Rivers Inlet hatchery.	6,820,264	
	Quap creek, Owikeno lake, B.C.	11,859,826	Rivers Inlet hatchery.	11,859,826	77,427,774
	Antigonish hatchery ponds, N.S.	5,647,161	Antigonish hatchery.	5,647,161	
	Margaree hatchery ponds, N.S.	873,574	Margaree hatchery.	873,574	
	Yarmouth hatchery ponds, N.S.	633,000	Yarmouth hatchery.	633,000	
	Florenceville hatchery ponds, N.B.	2,248,377	Florenceville hatchery.	2,248,377	
	Saint John hatchery ponds, N.B.	1,543,078	Saint John hatchery.	1,543,078	
	Cole's pond, P.E.I.	2,000	Kelly's Pond hatchery.	2,000	
	Kelly's Pond hatchery pond, P.E.I.	24,872	Kelly's Pond hatchery.	24,872	
	Vernilion lake, Alta.	150,400	Banff hatchery.	150,400	
	Violin lake, B.C.	281,280	Nelson hatchery.	281,280	
	Cowichan river, B.C.	277,152	Cowichan lake hatchery.	277,152	11,403,742
	Cowichan river, B.C.	78,000	Cowichan lake hatchery.	78,000	277,152
	Liumchin creek, Cultus lake, B.C.	62,300	Cultus lake hatchery.	62,300	
	Sweltzer creek, Cultus lake, B.C.	75,100	Cultus lake hatchery.	75,100	215,400
Spring salmon					
Steelhead salmon					
					132,149,691

## EYED EGGS PURCHASED IN 1935

Species	Month laid down	Purchased from	Laid down in hatchery	Number received	Total by species
Brown trout.....	December.....	(a) Rainbow Ranch, Troy, Montana.....	Banff.....	491,610	491,610
Cutthroat trout.....	June.....	(a) Crystal Lakes Fish Hatcheries, Fortine, Montana.....	Banff.....	481,840	481,840
	July.....	Rainbow Ranch, Troy, Montana.....	Banff.....	1,038,015	1,038,015
	June.....	Crystal Lakes Fish Hatcheries, Fortine, Montana.....	Cultus Lake.....	190,438	190,438
	June.....	(a) Crystal Lakes Fish Hatcheries, Fortine, Montana.....	Waterton lakes.....	395,360	395,360
Rainbow trout.....	July.....	Rainbow Ranch, Troy, Montana.....	Waterton lakes.....	200,200	2,305,853
	May, June.....	(a) Crystal Lakes Fish Hatcheries, Fortine, Montana.....	Banff.....	558,112	558,112
	May.....	(a) Crystal Lakes Fish Hatcheries, Fortine, Montana.....	Jasper Park.....	207,320	207,320
	May, June.....	(a) Crystal Lakes Fish Hatcheries, Fortine, Montana.....	Waterton lakes.....	910,100	1,675,532
Speckled trout.....	October, November.....	Donald Fraser, Esq., Plaster Rock, N.B.....	Grand Falls.....	821,726	821,726
	November, December.....	Earl Ings, Esq., Mount Herbert, P.E.I.....	Kelly's Pond.....	174,211	174,211
	January.....	Cape Cod Trout Company, Wareham, Mass.....	Middleton.....	750,000	750,000
	December.....	Rainbow Ranch, Troy, Montana.....	Banff.....	152,250	1,898,187
					6,371,182

## Summary of eggs received:

Total eggs collected.....	132,149,691
Total eggs purchased.....	6,371,182

138,520,873

Eyed eggs received 1935 from Department of Game and Fisheries, Toronto, Ontario, in exchange for Kamloops trout:

Salmon trout from Glenora hatchery, Picton, laid down as follows,—	
Middleton hatchery.....	100,000

Salmon trout from Port Arthur hatchery, laid down as follows,—	
Banff hatchery.....	99,000

Eyed eggs received 1935 from Department of Labour, Game and Fisheries, Quebec, in exchange for speckled trout:

Ouaniche salmon from hatchery at Saint Felicien, laid down as follows,—	
Middleton hatchery.....	30,000

(a) Purchased by the Department of Lands and Mines, Edmonton, Alberta.

IN THE INTEREST OF ECONOMY AND CONVENIENCE IN THE DISTRIBUTION OF FRY  
THE FOLLOWING TRANSFERS OF EYED EGGS WERE MADE IN 1935

Species	From	To	Number	Date received
Atlantic salmon.....	(a) Kelly's Pond.....	Bedford.....	1,250,000	February 14
	(a) Miramichi.....	Antigonish.....	1,000,000	March 29
	(a) Miramichi.....	Florenceville.....	143,653	February 13-April 24
	(a) Miramichi.....	Lindloff.....	612,196	April 11
	(a) Miramichi.....	Middleton.....	600,000	March 21
	(a) Restigouche.....	Restigouche.....	500,000	March 9
	(a) Restigouche.....	Grand Falls.....	300,000	April 3
	(a) Restigouche.....	Nipisiguit.....	479,275	April 10
Cutthroat trout.....	(b) Cultus lake.....	Smiths Falls.....	100,960	June 28
Kamloops trout.....	(b) Lloyd's creek.....	Pemberton.....	155,000	Week June 22
	(b) Lloyd's creek.....	Smiths Falls.....	50,000	July 4
	(b) Penask lake.....	Argenta.....	500,000	June 24, July 4
	(b) Penask lake.....	Nelson.....	260,000	June 15, July 3
	(b) Penask lake.....	Summerland.....	1,348,193	June 27, July 8, 13
Landlocked salmon.....	(a) Saint John.....	Middleton.....	30,000	March 15
Rainbow trout.....	(b) Antigonish.....	Lindloff.....	64,000	June 1, 6
	(b) Yarmouth.....	Kelly's Pond.....	35,000	May 9
Speckled trout.....	(a) Antigonish.....	Bedford.....	500,000	March 22
	(a) Antigonish.....	Lindloff.....	250,000	April 11
	(a) Antigonish.....	Margaree.....	100,000	March 2
	(a) Antigonish.....	Middleton.....	1,000,000	March 20
	(a) Antigonish.....	Miramichi.....	100,000	March 22
	(a) Antigonish.....	Restigouche.....	250,000	April 11
	(a) Antigonish.....	Yarmouth.....	1,000,000	March 30
Sockeye salmon.....	(a) Smiths Falls.....	Cultus lake.....	55,000	March 18
	(a) Smiths Falls.....	Pitt lake.....	4,255,862	March 8, 14

(a) 1934 fall collection.

(b) 1935 collection.

## MARKING OF SALMON

A total of 8 salmon bearing tags Nos. F5666, F5708, F5728, F5724, F5635, F5674, F5643 and F5628 were observed as they were passing through the fishway and trap into the Nictaux Salmon retaining pond. One of these bearing tag No. F5728 died in the pond. The other tags were detached during the summer as none of them were found on fish that were stripped, although the scars on the dorsal fins, where the tags had been, were quite apparent.

During the spawning season of 1930 while Atlantic salmon were being stripped for fish cultural purposes a percentage were tagged before they were liberated, 109 were weighed before and after they were stripped at Allens lake pond, Yarmouth county, Nova Scotia, 15 at Matapedia river, Quebec, and 204 at the Saint John retaining pond, New Brunswick. Three hundred and twenty-eight fish were handled at these three points, ranging in weight from  $3\frac{1}{2}$  pounds to 36 pounds before they were stripped. The eggs weighed, or the fish lost in weight due to stripping  $901\frac{3}{4}$  pounds or in the aggregate 24.04 per cent of the original weight of the fish before they were stripped. Although the fish were of all sizes from  $3\frac{1}{2}$  to 36 pounds, those weighing between 10 and 20 pounds made up the largest group.

At Allens lake the average loss in weight due to stripping was 24.96 per cent. At Saint John the eggs from the 204 fish which were handled weighed  $535\frac{3}{4}$  pounds, which meant that their removal brought a weight loss of 23.71 per cent. On the Matapedia the 15 salmon weighed  $282\frac{1}{2}$  pounds before they were stripped and in the stripping they lost 64 pounds or 22.65 per cent of their weight.

There was some variation in the percentage loss in salmon of different weights. At Allens lake in 11 salmon ranging from  $3\frac{1}{2}$  to 5 pounds and 58, (including the 11), ranging from  $3\frac{1}{2}$  to 9 pounds, the average loss in weight was 25.95 per cent. At Saint John there was a loss of 22.18 per cent in 50 salmon ranging from  $6\frac{1}{2}$  to 9 pounds before they were stripped. At Allens lake there was a loss of 25.06 per cent in 47 fish ranging from 6 to 9 pounds. The loss in weight in fish ranging from 10 to 17 pounds each was as follows:—

Allens lake..	..	35 salmon, loss in weight 24.36 per cent
Matapedia..	..	4 salmon, loss in weight 24.78 per cent
Saint John..	..	154 salmon, loss in weight 24.09 per cent



The average loss in this group at all ponds was 24.16 per cent.

All of these fish were weighed, marked with numbered tags and liberated between October 28 and November 20, 1930. Seven recaptures have since been reported, two from the Allens lake group and five from the Saint John group. Those of the former group were recaptured on April 2, 1931, at Salmon river, Digby county, and on June 27, 1931, at Rapid Falls, Mersey river, Nova Scotia. They had only regained the weight they had lost due to stripping, that is 3 pounds in the first instance (tag No. F2297) and one-half pound (tag No. F2213) in the second instance. Their respective weights when recaptured were 11 and 3½ pounds.

Of the Saint John fish, one was recaptured in September, 1931, (tag No. F.4415) and weighed 15½ pounds or 3 pounds and 5½ pounds respectively in excess of its weight before and after it was stripped on November 12, 1930. The other 4 salmon were caught in 1932 in the second year after they were liberated (tags Nos. F.4412, F.4418, F.4443 and F.4708). The first three weighed respectively in excess of their weights before and after they were stripped in 1930, 10 and 12½ pounds; 6 and 8½ pounds; and 8¾ and 12 pounds. The fourth fish (tag No. F.4708) was picked up dead at the mouth of the Nashwaaksis river on May 20, 1932.

### MARKING OF FISH

The marking of Atlantic salmon handled for fish cultural purposes at the several salmon retaining pools, which commenced in 1913, was continued in 1935 at Margaree pond, Nova Scotia. Atlantic, ouananiche and sebago salmon, speckled and salmon trout and brown trout hybrids in the east and in the west sockeye and spring salmon fingerlings, yearlings and older fish were marked by clipping of fins. The extent of marking is shown in the following statement:—

Marked and liberated at	Species	Number marked	Dates of marking	Nature of mark	Object— To throw some light on
Margaree pond, N.S.....	Atlantic salmon, adults.....	641	Nov. 18, 20, 21, 22, 26, 27, 28, Dec. 3, 5, 6, 7.	Silver tag attached to dorsal fin.	The movements of Atlantic salmon in the sea, frequency in spawning and the extent to which early fish of any season return as early fish, or vice versa.
Antigonish hatchery, N.S....	Speckled trout, two years.....	2, 262	.....	Removal of adipose and right pectoral fins.	Movements, growth and survival of hatchery product.
	Speckled trout, three and four years.....	1, 034	.....	" "	" "
Margaree hatchery, N.S.....	Atlantic salmon, fingerlings.....	5, 000	.....	" "	" "
Middleton hatchery, N.S....	Speckled trout fingerlings.....	4, 000	.....	Removal of adipose and left ventral fins.....	" "
	Salmon trout fingerlings.....	900	.....	" "	" "
	Ouananiche salmon fingerlings.....	875	.....	" "	" "
	Sebago salmon fingerlings.....	400	.....	" "	" "
Nictaux Falls rearing station, N.S.....	Atlantic salmon fingerlings.....	18, 000	.....	" "	" "
Yarmouth hatchery, N.S....	Speckled trout fingerlings.....	10, 000	.....	Removal of adipose and right ventral fins.....	" "
	Speckled trout yearlings.....	35, 500	.....	" "	" "
	Speckled trout two years.....	1, 000	.....	" "	" "
	Speckled trout three years.....	882	.....	" "	" "
	Speckled trout four years.....	28	.....	" "	" "
	Speckled trout six years.....	5	.....	" "	" "
Florenceville hatchery, N.B.	Atlantic salmon fingerlings.....	10, 325	.....	Removal of adipose and left pectoral fins.....	" "
	Atlantic salmon yearlings.....	9, 480	.....	" "	" "
	Speckled trout fingerlings.....	11, 550	.....	" "	" "
Grand Falls hatchery, N.B.	Atlantic salmon fingerlings (Restigouche stock).....	25, 620	.....	" "	" "
	Speckled trout yearlings.....	1, 728	.....	Removal of adipose and right pectoral fins.....	" "
Saint John hatchery, N.B..	Speckled trout five years.....	11	.....	" "	" "
	Sebago salmon yearlings.....	5, 241	.....	" "	" "
	Brown trout hybrids yearlings.....	6, 006	.....	" "	" "
Cowichan lake hatchery, B.C.	Spring salmon fingerlings.....	12, 500	June 4.....	Removal of both adipose and right and left ventral fins.	The percentage of artificially fed fry that return as adults.

## DEPARTMENT OF FISHERIES

## RECAPTURES, 1935—ATLANTIC SALMON

## MARGAREE RIVER, N.S.

Number	Weight (lbs.)	Length (ins.)	Condition	Sex	Date	1. Where liberated 2. Where caught
F5903	9 25	31 38.2	Kelt..... Clean.....	M M	Dec. 11, 1933 Aug. 8, 1935	Margaree Pond, N.S. McLean Cove, Margaree Har- bour, N.S.
F5926	14 22	34 38.6	Kelt..... Clean.....	F F	Nov. 14, 1933 July 4, 1935	Margaree Pond, N.S. Two miles northeast of Mar- garee Harbour, N.S. (down coast).
F5948	9 22½	32 37	Kelt..... Clean.....	M M	Dec. 11, 1933 June 24, 1935	Margaree Pond, N.S. Three miles northeast of Cheti- camp, N.S. (down coast)
F6000	8 18	30 36.2	Kelt..... Clean.....	F F	Dec. 7, 1933 July 18, 1935	Margaree Pond, N.S. Aucoin point, three miles north- east of Margaree Harbour, N.S.
F6010	9 17	30 36	Kelt..... Clean.....	M M	Dec. 11, 1933 July 29, 1935	Margaree Pond, N.S. Aucoin point, three miles north- east of Margaree Harbour, N.S.
F6038	11 22	35 40	Kelt..... Clean.....	M M	Dec. 11, 1933 Aug. 1, 1935	Margaree Pond, N.S. Friar Head, Inverness county, N.S.
F6105	9 13½	30 34	Kelt..... Clean.....	F F	Nov. 21, 1934 Aug. 14, 1935	Margaree Pond, N.S. Petit Etang, Inverness county, N.S.
F6618	9 (v) 18 or 20	29 .....	Kelt..... Clean.....	F F	Dec. 3, 1934 June 20, 1935	Margaree Pond, N.S. Doyle's pool, Northeast Mar- garee river, N.S.
F6639	20 .....	39 .....	Kelt..... Clean.....	F F	Nov. 26, 1934 June 20, 1935	Margaree Pond, N.S. Point Cross, Inverness county, N.S.
F6705	26 .....	40 .....	Kelt..... Kelt.....	F F	Nov. 28, 1934 June 1935	Margaree Pond, N.S. Ethridge pool, Northeast Mar- garee river, N.S.
F6866	18	35 37.4	Kelt..... Clean.....	F F	Dec. 3, 1934 July 12, 1935	Margaree Pond, N.S. Hut pool, Margaree river, N.S.
F6891	20	39 40	Kelt..... Kelt.....	F F	Nov. 28, 1934 1935	Margaree Pond, N.S. Mouth of Margaree river, N.S.
F6941	15 (u) 20	35 40	Kelt..... Kelt.....	F F	Nov. 26, 1934 1935	Margaree Pond, N.S. Mouth of Margaree river, N.S.

## NICTAUX RIVER, N.S.

F5628	8 .....	32½ .....	Kelt..... Clean.....	F F	Nov. 3, 1933 June 1935	Nictaux Pond, N.S. Nictaux river, N.S.
F5635	8½ .....	33½ .....	Kelt..... Clean.....	F F	Nov. 8, 1933 June 1935	Nictaux Pond, N.S. Nictaux river, N.S.
F5643	8½ .....	32 .....	Kelt..... Clean.....	F F	Nov. 8, 1933 June 1935	Nictaux Pond, N.S. Nictaux river, N.S.
F5646	5 13½	30 33	Kelt..... Clean.....	F F	Nov. 8, 1933 May 13, 1935	Nictaux Pond, N.S. Annapolis river, below Para- dise, N.S.
F5666	4½ .....	28½ .....	Kelt..... Clean.....	F F	Nov. 8, 1933 June 1935	Nictaux Pond, N.S. Nictaux river, N.S.



RECAPTURES—ATLANTIC SALMON—*Concluded*NICTAUX RIVER, N.S.—*Concluded*

Number	Weight (lbs.)	Length (ins.)	Condition	Sex	Date	1. Where liberated 2. Where caught
F5674	5	29½	Kelt..... Clean.....	F F	Nov. 8, 1933 June 1935	Nictaux Pond, N.S. Nictaux river, N.S.
F5708	8	33	Kelt..... Clean.....	F F	Nov. 13, 1933 June 1935	Nictaux Pond, N.S. Nictaux river, N.S.
F5724	5	27½	Kelt..... Clean.....	F F	Nov. 13, 1933 June 1935	Nictaux Pond, N.S. Nictaux river, N.S.
F5728	5	29	Kelt..... Clean.....	F F	Nov. 13, 1933 June 1935	Nictaux Pond, N.S. Nictaux river, N.S.
F6231	10 14	33	Kelt..... Clean.....	F F	Oct. 30, 1934 July 8, 1935	Nictaux Pond, N.S. Sandford trap at Yarmouth, N.S.
F6259	5½ 14	28 33	Kelt..... Clean.....	F F	Nov. 3, 1934 Nov. 20, 1935	Nictaux Pond, N.S. Lower Amherst Cove, Bona- vista bay, Newfoundland.

## SACKVILLE RIVER, N.S.

F5752	8½ 15	31½ 37	Kelt..... Kelt.....	F F	Nov. 10, 1933 Nov. 4, 1935	Sackville river, N.S. Sackville river, N.S.
F5759	2 (u) 9	24 30½	Kelt..... Kelt.....	F F	Nov. 10, 1933 Nov. 5, 1935	Sackville river, N.S. Sackville river, N.S.
F5763	14½ (u) 18	38 39½	Kelt..... Kelt.....	F F	Nov. 10, 1933 Nov. 5, 1935	Sackville river, N.S. Sackville river, N.S.
F5789	5 11	26 .....	Kelt..... Clean.....	M M	Nov. 10, 1933 June 25, 1935	Sackville river, N.S. Northwest of Drumhead breakwater, Drumhead, N.S.
F5798	10½ 25	35 42	Kelt..... Clean.....	F F	Nov. 13, 1933 June 25, 1935	Sackville river, N.S. Five miles west of Margaree harbour, N.S. (down coast)
F5861	2½ (u) 13	22 33	Kelt..... Kelt.....	M M	Nov. 14, 1933 Nov. 4, 1935	Sackville river, N.S. Sackville river, N.S.
F5877	3 12½	24 32	Kelt..... Clean.....	M M	Nov. 15, 1933 July 6, 1935	Sackville river, N.S. Upper Bedford Basin, N.S.
F6394	7½ 15	31½ .....	Kelt..... Clean.....	F F	Nov. 12, 1934 July 3, 1935	Sackville river, Bedford, N.S. Bedford Basin, N.S.

(u) Liberated with same tag attached.

(v) Estimated "18 or 20 pounds".

NOVA SCOTIA  
ANTIGONISH HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 finger-lings	Atlantic salmon No. 2 finger-lings	Rainbow trout finger-lings	Rainbow trout 4 years old	Speckled trout eyed fry	Speckled trout advanced fry	Speckled trout No. 1 finger-lings	Speckled trout No. 2 finger-lings	Speckled trout No. 4 finger-lings	Speckled trout year-lings	Speckled trout 2 years old	Speckled trout 3 years old	Speckled trout 4 years old	Speckled trout 5 years old
Seignory Club, Montebello, Quebec.						3,000									
Antigonish Co.—															
Alton river.		5,000						75,000							
Beaver Meadow river.		20,000						10,000							
Brierly brook.								15,000				300			
Cameron lake.								40,000		3,000		1,721			
Copper lake.												1,200			5
Glenroy river.												300			
Gaspereau lake.									5,000						
Grant lake.	50,000										1,769			681	
James river.								15,000							
Johnston lake.							155,281	75,000	26,000						
Maryval brook.							10,000						833		
Meath Green river.							40,000			3,000	483				
North lake.								40,000							
Paisvale lake.								10,000			1,981	1,278			
Polson brook—South river.							4,823	15,177							
Right river.		30,000							40,000						
South lake.															
South river.		40,000	20,279					80,000				3,577	1,100		
South river lake.													1,055		
Trasadie river.	70,000	10,000							100,000		2,600	775			
West river.										6,000					
Colchester Co.—															
Whitley Wha lake.															
Cumberland Co.—															
Leak lake.									35,000						
Pugwash river.															
River Philip.		60,000													
Wallace river.		65,000													
Guysboro Co.—															
Campbell lake.								10,000							
Chisholm lake.								5,000							
Chain of lakes—Cole Harbour.								35,000							
Copper lake.								25,000							
Country Harbour river.								75,000							
Donahue lake.	35,000							40,000							
Ecum Secum river.								20,000							
Eight Island lake.															
Forbes Wall lake.									4,000						
Giant lake.															
Goldboro lake.					650	145									
Goshen lake.								20,000	15,000						
Hazel Hill lake.								35,000							

[illegible]

Total distribution.

2,831,304







## LINDLOFF SUB-HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Atlantic salmon No. 2 fingerlings	Rainbow trout No. 2 fingerlings	Speckled trout No. 3 fingerlings
Cape Breton Co.—					
Black brook-Mira river.....					7,500
Gaspereau river.....	131,000				
Gillis lake.....					5,000
McMillan lake.....				15,000	
Meadow brook-Sydney river.....					5,000
Salmon river.....		184,788	30,000		
Trout river.....					7,500
Inverness Co.—					
Glen brook-Inhabitants river.....					5,000
McIntyre lake.....					5,000
Richmond Co.—					
Grand river.....	175,000				
Lindloff lake.....				21,418	
McIsaac lake.....					5,000
McKay brook-Grand river.....	40,000				
Murchison brook-Grand river.....	40,000				
Shaw lake.....					5,000
	386,000	184,788	30,000	36,418	45,000
Total distribution.....				682,206	



## MARGAREE HATCHERY

[illegible]



	500,000	2,170,000	440,000	280,000	259,038	28,982	96,339	105,661	23,188	1,500	5
Victoria Co.—											
Baddeck river.....		150,000								5,000	
East branch.....		80,000									
Forks.....		80,000									
Gillis brook.....							5,000				
McDonald brook.....							5,000				
North branch.....											
Barasias river.....		80,000									
Clyburn brook.....											
Hume river.....								8,000		6,000	
Indian brook.....							5,000				
Middle river.....	50,000	150,000					5,000				
Beaver brook.....	50,000	25,000									
Black brook.....							5,000				
Foot bridge.....		40,000									
Gold brook.....							3,000				
Between Hector, Morrison and Mc-											
Charles Brooks.....											
Indian brook.....		80,000									
McKenzie brook.....		80,000									
McLennan's brook.....							5,000				
North river.....		80,000	90,000								
Church brook.....							8,000				
North Aspy river.....							11,339				
South Gut brook.....							5,000				
Warren lake.....											
Washabuck river.....							8,000				
Total distribution.....	500,000	2,170,000	440,000	280,000	259,038	28,982	96,339	105,661	23,188	1,500	5

Total distribution.

3,904,713

•

•  
•  
•  
•  
•  
•  
•  
•  
•

•  
•  
•  
•  
•  
•  
•

.....

•  
•  
•  
•  
•  
•  
•  
•  
•  
•

•  
•  
•  
•  
•  
•  
•  
•  
•  
•

•  
•  
•  
•  
•  
•  
•  
•  
•

•  
•  
•  
•  
•  
•  
•  
•  
•  
•

bution...

Total dis





[illegible]

Total distribution	1,522,236
--------------------	-----------

## NICTAUX FALLS REARING STATION

	Atlantic salmon No. 3 fingerlings	Atlantic salmon No. 4 fingerlings
—		
Annapolis Co.— Nictaux river.....	20,000	22,800
Total distribution.....		42,800

## DEPARTMENT OF FISHERIES

## YARMOUTH

[illegible]



## HATCHERY

Rain- bow trout No. 5 finger- lings	Rain- bow trout year- lings	Rain- bow trout 2 years old	Speck- led trout No. 1 finger- lings	Speck- led trout No. 2 finger- lings	Speck- led trout No. 3 finger- lings	Speck- led trout No. 4 finger- lings	Speck- led trout No. 5 finger- lings	Speck- led trout year- lings	Speck- led trout 2 years old	Speck- led trout 3 years old	Speck- led trout 4 years old	Speck- led trout 6 years old	No.
													1
								3,000					2
				20,000									3
							6,400						4
				20,000									5
								700					6
			20,000										7
								1,500					8
13,000													9
			20,000										10
							4,400						11
			20,000										12
				20,000									13
								1,500					14
								2,300					15
			30,000										16
				15,000									17
			75,000										18
								2,000					19
							7,000						20
				15,000									21
3,000		1,000											22
													23
								4,000					24
				40,000									25
				40,000									26
						45				17			27
				200				24	8	1			28
	8,000												29
					12,000	2,000		1,500					30
					12,000	5,000		1,500					31
							2,500						32
							2,500						33
						45		12					34
	2,800												35
3,000	3,000												36
								1,500					37
								1,000					38

No.		Atlantic salmon ad- vanced fry	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Atlantic salmon No. 3 finger- lings	Atlantic salmon No. 4 finger- lings	Atlantic salmon No. 5 finger- lings	Atlantic salmon year- lings	Kam- loops trout 3 years old	Rain- bow trout No. 3 finger- lings	Rain- bow trout No. 4 finger- lings
39	Lower Great brook.....										
40	Medway river.....			60,000							
41	Mersey river.....		30,000	10,000				1,000			
42	Mersey river rearing pool.....		60,000	25,000							
43	Minard lake.....										
44	Shupes lake.....										
45	Upper Great brook.....										
46	Shelburne Co.— Barclay brook—Jordan river.....										
47	Barrington river.....										
48	Bloody creek.....										
49	Clam lake.....										
50	Clyde river.....	60,000				13,000					
51	East river.....										
52	Hamilton branch—Clyde river.....										
53	Jordan river.....										
54	Ogden brook.....										
55	Roseway river.....			30,000		8,000					
56	Yarmouth Co.— Bird lake.....										4,955
57	Brazil lake.....										
58	Burrell brook.....										
59	Carleton river.....										
60	Coldstream river.....										
61	Duck lake.....										
62	East branch brook—Tusket river.....										
63	French lake.....										
64	Gardener brook.....										
65	Hooper lake.....										
66	Killam brook.....						6,000				
67	Lake Ellenwood.....										
68	Lake Skinner.....										
69	Lake Utley.....								87		
70	Little Meadow brook.....										
71	Meadow brook.....										
72	Pleasant lake.....										
73	Reynard bridge—Carleton river.....										
74	Roberts Island lake.....										
75	Salmon river.....			20,000							
76	Salmon lake.....										
77	Travis brook.....										
78	Trefry lake.....										
79	Tusket river.....										
80	Whistler lake.....										
		110,000	90,000	225,000	95	25,955	6,000	1,000	87	7,045	27,955

Total distribution.....

HATCHERY

Rain- bow trout No. 5 finger- lings	Rain- bow trout year- lings	Rain- bow trout 2 years old	Speck- led trout No. 1 finger- lings	Speck- led trout No. 2 finger- lings	Speck- led trout No. 3 finger- lings	Speck- led trout No. 4 finger- lings	Speck- led trout No. 5 finger- lings	Speck- led trout year- lings	Speck- led trout 2 years old	Speck- led trout 3 years old	Speck- led trout 4 years old	Speck- led trout 6 years old	No.
								1,000					39
													40
													41
													42
								1,500					43
								1,000					44
								1,500					45
				20,000									46
			60,000					1,500					47
			35,000										48
	5,500												49
				20,000									50
								2,000					51
								1,500					52
								1,500					53
				20,000									54
													55
4,000													56
		500											57
			20,000										58
			60,000				4,000						59
							8,000	2,000					60
								1,500					61
			25,000										62
				40,000									63
			50,000				10,000						64
			30,000										65
													66
								2,000					67
								500	1,000	882	28	5	68
			25,000										69
							4,000						70
			40,000										71
													72
								2,000					73
								1,500					74
													75
								1,500					76
			20,000										77
								800					78
			60,000				4,000						79
								2,500					80
23,000	19,300	1,500	590,000	270,200	24,000	7,090	52,800	46,336	1,025	883	28	5	

1,529,304



NEW BRUNSWICK  
FLORENCEVILLE HATCHERY

	Atlantic salmon fry	Atlantic salmon No. 1 finger-lings	Atlantic salmon No. 2 finger-lings	Atlantic salmon No. 3 finger-lings	Atlantic salmon year-lings	Speckled trout No. 1 finger-lings	Speckled trout No. 2 finger-lings	Speckled trout finger-lings	Speckled trout 2 years old	Speckled trout 4 years old	Speckled trout 5 years old	Speckled trout 6 years old
Boston Sportsmen's Show												
Fredericton Exhibition			500		100				2	4	20	5
Carleton Co.—											2	
Becaguinec river	100,000	100,000				85,000		4,000				
Big Guisguilt river	100,000			1,200								
Big Presquille river		15,000										
Bogan brook—South West Miramichi river						7,000						
Bubby brook—Saint John river						70,000						
Bull creek—Saint John river						10,000						
Burpee brook—Big Presquille river						1,000						
Buttermilk creek—Saint John river												
Centreville pond											106	
Clearwater brook—South West Miramichi river		15,000				10,000						
Colton brook—Shiktahawk river						2,000						
Dingee brook—Saint John river												
Elliot brook—South West Miramichi river		25,000										
Gallivan brook—Saint John river						10,000		2,000				
Gibson mill brook—Saint John river						30,000	5,000					
Glassville pond—Shiktahawk river						25,000						
Hagerman brook—Saint John river						10,000		2,500				
Hardwood brook—Saint John river						10,000						
Lanes creek—Saint John river						75,000		4,000				
Little Guisguilt river		70,000										
Little Shiktahawk river						15,000		2,500				
Mallory brook—Saint John river												
Marven brook—Meduxnekeag river	10,000					60,000		4,000				
Maynes brook—Presquille river						55,000						
McLeary brook—Lakeville pond						70,000						
McQuade pond—Saint John river												
Meduxnekeag river	90,000											
South West Miramichi river, North Branch		200,000										
South West Miramichi river, South Branch	100,000	60,000										
Monquart river	100,000	100,000		1,400								
Payson lake						20,000						
Priest brook—Shiktahawk river						10,000						
River de Chute						75,000		4,000		102		
Saint John river												
Shiktahawk river	100,000				7,943							
Simpson brook—South West Miramichi river	100,000	100,000		1,381								
Smith brook—Becaguinec river		15,000				10,000						

21852—104	Stickney brook—Saint John river. Tegue brook—South West Miramichi river. Tweedie brook—Saint John river. Charlotte Co.— Perley brook—South Oromocto lake. York Co.— Anderson brook—Saint John river. Brown lake. Burpee brook—Grand lake. Charlie lake. Clincher brook—Maguadavic river. Conn brook—Shogomoc river. Cross creek—Nashwaak river. Davidson lake. Davis brook—Maguadavic river. Dead creek—Eel river. Second Eel river lake. Harvey lake. Indian lake. Keswick river. Kingsley brook—Nashwaaksis river. Lily lake and brook—Magundy river. Limekiln brook—Nashwaak river. Long creek—Saint John river. Mactaquac river. McBean brook—Nashwaak river. McCullum creek—Nashwaak river. Manzer Mill stream—Nashwaak river. Middle brook—Nashwaak river. Mill brook—Mactaquac river. Nackawic river. Nackawic river—North East branch. Nashwaak river. Nashwaaksis river. Nigger brook—Nackawic river. Pidgeon brook—Nashwaak river. Pokiok river. Risteen lake. Russiagomis stream—Oromocto river. Shogomoc river. Skiff lake. Sucker brook—Skiff lake. Taffa lake. Tay river. Tinkettle brook—Nashwaak river. Zealand lake. Yoho lake.	600,000	985,000	500	14,748	10,043	1,458,000	23,000	57,000	2	106	128	5
-----------	--	---------	---------	-----	--------	--------	-----------	--------	--------	---	-----	-----	---

Total distribution.

3, 148, 532

21852—104

3, 148, 532

## GRAND FALLS HATCHERY

	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Atlantic salmon No. 3 finger- lings	Speckled trout advanced fry	Speckled trout No. 1 finger- lings	Speckled trout No. 2 finger- lings	Speckled trout No. 3 finger- lings
Salmon river—Victoria Co.—							
Salmon river, at Estey camp		50,000	12,000				
Salmon river, at Guimont lodge	15,000	10,000					
Salmon river, at Mignault lodge	25,000	10,000					
Salmon river, at Theriault Mill		12,500					
Salmon river, headwaters		84,265	85,000				
Salmon river, mouth of	75,000		8,000				
Salmon river flats	10,000						
Aubin crossing	25,000	10,000					
Big bogan		10,000					
Boat landing	65,000	10,000	27,000				
Cote mill	65,000	10,000					
Covered bridge	20,000	10,000					
Cyr flats		12,500					
Danish mill	65,000	12,500					
Foley brook	25,000	25,000					
Iron bridge		10,000					
Little Salmon river	65,000	12,500					
Sutherland brook					40,000		
Saint John river—Victoria Co.—							
At hatchery	27,000						
Andover	25,000	10,000	8,000				
Andover, upper	40,000		8,000				
Argosy	65,000	10,000					
Aroostock bar	65,000		15,000				
Boutout brook	65,000						
Cliffordvale	25,000	10,000			15,000		
Coronation		10,000					
Costigan point	35,000						
Dee point	35,000	10,000					
Four Falls brook							
Fraser's dead water, Three brooks				25,000	20,000		2,000
Gallagher flats		10,000					
Hatchery brook, above falls					34,000		1,000
Hatchery brook, below falls	12,000		299				
Inman flats	80,000	10,000	15,000				
Kilburn ferry			12,000				
Limestone	65,000						
Little river					75,000		
Morrillsiding	65,000		9,000				
Mulherin brook							4,000
Muniac river	40,000						
Muniac river, mouth of	90,000		15,000				
Muniac river, upper	15,000						
Ortonville	65,000						
Ouellette brook					20,000		
Perth		15,000					
Perth Junction	25,000						
Perth, lower	25,000	10,000					
Perth, upper			4,000				
Pokiok brook					50,000		
Price brook						8,558	
Tobique river—							
Arthurette bridge			7,500				
Haley brook	30,000						
Millers bogan	40,000		7,500				
Red rapids			7,500				
Two brooks	30,000						
Waters bogan			7,500				
Watson flats		10,000					
Madawaska Co.—							
Baker lake					45,000		
Baker brook					15,000		
Grand river					90,000		
Green river				45,000	50,000	70,000	25,000
Private pond, Green river, Mr. H. T.							
Lajoie				5,000			
Iroquois river				34,704	250,296		
Ledges pond					10,000		
Little river					165,000		
Dead brook					75,000		
Headwaters				35,000			
Ryan brook							12,500
Six Mile brook					75,000		
Ten Mile brook					75,000		
Quisibis river					35,000		
Siegas river						20,000	
Trout brook						35,000	8,454
Unique lake					30,000		
York Co.—							
Nashwaak river			25,000				
	1,419,000	394,265	273,299	144,704	1,169,296	133,558	52,954

Total distribution ..... 3,587,076



## MIRAMICHI HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Speckled trout No. 1 finger- lings	Speckled trout No. 2 finger- lings	Speckled trout No. 3 finger- lings	Speckled trout year- lings
Bartibog river.....		42,000	54,400				
Bass river.....		36,000					
Bay du Vin river.....	54,400		53,650				
Black river—Northumberland Co.....	54,400		77,850				
Black river—Westmorland Co.....						900	
Buctouche river.....			43,400				
Burnt Church river.....		76,400					
Caraget river.....				16,000			
Cocagne river.....			28,050				
Estey lake.....				5,000			
Elmtree river.....					500	5,600	
Grand Aldouane river.....						1,222	
Kouchibouguac river.....			53,650				
Little river—Nipisiguit bay.....				4,000			
Little South West Miramichi river.....		676,000	51,200				
Middle river.....			48,000				
Nappan river.....	54,400						
Nigadu river.....					500		
North West Miramichi river.....	864,000	26,000	99,200				
Millstream brook.....	54,400		112,950				
Sevogle river.....			198,400				
Stewart brook.....			10,600				
Trout brook.....		40,800					
Richibucto river.....			43,400				
Shadduck lake.....				4,000			
South West Miramichi river—							
Barnaby river.....	54,400	54,400					
East branch.....							96
Bartholomew river.....		42,000					
Cain river.....		156,000	79,250				
Renous river.....		120,400	53,650				
Dungarvon river.....		118,400					
Taxis river.....		54,400	44,800				
Tabusintac river.....	54,400	42,000	28,050				
Eskedelloc river.....				10,000			
Tetagouche river.....			51,200				
Little Tracadie river.....				16,000			
Votoure lake.....				10,000			
Wrigley lake.....				7,500			
	1,190,400	1,484,800	1,131,700	72,500	1,000	7,722	96
Total distribution.....						3,883,218	

## NIPISIGUIT SUB-HATCHERY

	Atlantic salmon fry		Atlantic salmon fry
Nipisiguit river—		Nipisiguit river—	
Bear island, foot of....	40,000	Gilmore brook.....	35,000
Bear i land, head of....	50,000	Knight brook.....	40,000
Boudreau beach.....	45,000	Long Meadow, head of.	30,000
Church point.....	47,084	Middle beach.....	45,000
Club House pool.....	50,000		
Comeau landing.....	40,000		422,084
Total distribution.....			422,084

## RESTIGOUCHE HATCHERY

	Atlantic salmon fry	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Speckled trout fry	Speckled trout advanced fry	Speckled trout No. 1 fingerlings
Atlantic Biological Station, Saint Andrews.....	40	10	5			
Black lake.....				10,000		
Charlo river.....				20,387		
Charlo river pond.....				45,200		
Lily lake.....				5,000		
Shipyard lake.....				11,100		
Christopher brook.....				23,000		837
Grog brook.....				39,650		
Jacquet river.....	50,000					
Island lake.....				23,000		
Jack Burns lake.....				23,000		
Loch Lomond.....				4,000		
Middle river.....	50,000					
Restigouche river.....	495,000	250	51,000			
Hatchery brook.....					159	1,383
Kedgwick river.....	38,290					
Little Main river.....	50,000					
Matapedia river.....	360,000		20,000			
Upsalquitch river.....	370,000		18,585			
Walker brook.....				18,760		
	1,413,330	260	89,590	222,897	159	2,220
Total distribution.....					1,728,456	

No.		Atlantic salmon green eggs	Atlantic salmon eyed eggs	Atlantic salmon fry	Atlantic salmon ad- vanced fry	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Atlantic salmon No. 4 finger- lings	Atlantic salmon year- lings	Brown trout hybrid year- lings
1	Atlantic Biological Station, Saint Andrews, N.B.		1,250	200	75	55	60			
2	Dr. A. G. Huntsman, Toronto, Ont.	2,800	3,000							
3	Boston Sportsmen's Show									
	Albert Co.—									
4	McFadden lake									
5	Little river									
6	Point Wolfe river									
7	Pollett river									
8	Turtle creek-Petitcodiac river									
9	West river									
	Charlotte Co.—									
10	Big Eel lake									
11	Little Eel lake									
12	Bonaparte lake									
13	Burns brook-Digdeguash river									
14	Chamcook lake									
15	Clarence stream-Magaguadavic river				75,000					
16	Craig brook-Digdeguash river									
17	Digdeguash river									
18	Disappointment lake									
19	Gibson lake									
20	Green Brown brook-Kanus river									
21	Hitching brook-Digdeguash river									
22	Kerr lake									
23	Lake Utopia									
24	Limeburner lake									
25	Magaguadavic river				100,000					
26	McDougall lake									
27	Murchie brook-Saint Croix river									
28	New river									
29	Pocologan river				75,000					
30	Red Rock lake									
31	Roix lake									
32	Saint Andrews rearing pond									
33	Saint Patrick lake									
34	Seal Cove brook									
35	Sloop Cove pond									
36	Stein lake									
	Kent Co.—									
37	Buctouche river									
38	Cocagne river									
39	McKee Mills									
40	Richibucto river, Coal branch									
41	Salmon river									
42	Saint Nicholas river, south branch									
	Kings Co.—									
43	Deer lake									
44	Eagle lake									
45	Grassy lake									
46	Hammond river									
47	Kennebecasis river				150,000					
48	Kennebecasis river, headwaters									
49	Kennebecasis river, south branch									
50	Moss Glen lake									
51	Pichette lake									
52	Pollett lake									
53	Price brook-Canaan river									
54	Round lake									
55	Wetmore dam—Kennebecasis river									
	Queens Co.—									
56	Canaan river, north fork									
57	Salmon river					50,000				
	Saint John Co.—									
58	Bain brook								1,000	
59	Beaver lake									
60	Black river				75,000				3,129	
61	Blackhall lake									
62	Blindman lake									99
63	Boaz lake									
64	Brown lake									
65	Crescent lake									
66	Donaldson lake									
67	Douglas lake									
68	Germain brook-Hammond river									
69	Grassy lake									
70	Hanford brook									
71	Lake Henry									
72	Lily lake-Rockwood park									
73	Little river								8,066	418
74	Little river reservoir									





No.		Atlantic salmon green eggs	Atlantic salmon eyed eggs	Atlantic salmon fry	Atlantic salmon ad- vanced fry	Atlantic salmon No. 1 finger- lings	Atlantic salmon No. 2 finger- lings	Atlantic salmon No. 4 finger- lings	Atlantic salmon year- lings	Brown trout hybrid year- lings
75	Loch Alva-Saint John and Kings									
76	Cos.....									
76	Loch Lomond.....									
77	*Stephenson's brook pond, Loch									
77	Lomond.....									
78	McDonald lake.....									
79	Milligan lake.....									
80	Mispek river.....				75,000			6,277	1,500	
81	Otter lake.....									
82	Shadow lake.....									5,489
83	Southern lake.....									
84	Taylor lake.....									
85	Tyne Mouth creek.....					50,000				
	Sunbury Co.—									
86	Brizley river.....									
87	Hardwood creek.....									
88	Oromocto river, south branch.....					50,000				
89	Otter brook.....									
90	Peltoma lake.....									
91	Rockwell stream.....									
92	Shin creek.....									
93	Three Tree creek.....									
	Westmorland Co.—									
94	Anagance river.....									
95	Bennett brook-Petitcodiac river.....									
	York Co.—									
96	Baker brook pond.....									
97	Big Cranberry lake.....									
98	Little Cranberry lake.....									
99	Digity stream.....									
100	Grand lake.....					25,000	3,000			
101	Harvey lake.....									
102	Lake George.....									
103	Long creek-Saint John river.....									
104	Magaguadavic lake.....									
105	Mink lake.....									
106	Pirate brook.....									
107	Skiff lake.....									
108	Tom Davis lake.....									
109	West Yoho lake.....									
		2,800	4,250	200	550,075	175,055	3,060	6,277	13,695	6,006

Total distribution.....

Operated by Saint John branch of the New Brunswick Fish and Game Protective Association in conjunction with

## HATCHERY—Concluded

Brown trout hybrids, 4 years old	Land-locked salmon No. 1 finger-lings	Land-locked salmon year-lings	Loch Leven trout year-lings	Speckled trout eyed eggs	Speckled trout fry	Speckled trout advanced fry	Speckled trout No. 1 finger-lings	Speckled trout No. 2 year-lings	Speckled trout year-lings	Speckled trout 3 years old	Speckled trout 5 years old	No.
								4,000				75
								5,000				76
							15,000					77
					10,000							78
							15,000					79
							10,000					80
												81
							10,000					82
							15,000					83
												84
												85
							7,500					86
							10,000					87
												88
							15,000					89
								5,000				90
							7,500					91
							10,000					92
							10,000					93
							10,000					94
							10,000					95
							10,000					96
							15,000					97
							15,000					98
							5,000					99
												100
							20,000					101
							20,000					102
							15,000					103
							15,000					104
							15,000					105
							10,000					106
								3,000				107
	25,000						15,000					108
							15,000					109
4	54,072	12,495	871	1,100	100,300	125,000	790,275	25,075	19,759	25	11	

1,890,405

the Loch Lomond Protective Association.

PRINCE EDWARD ISLAND  
KELLY'S POND HATCHERY

	Atlantic salmon advanced fry	Atlantic salmon No. 1 fingerlings	Rainbow trout No. 1 fingerlings	Speckled trout advanced fry	Speckled trout No. 1 fingerlings
<b>Kings Co.—</b>					
Big pond.....					6,000
Coogan stream-Morell river.....	38,400	12,800			
Dunphy brook-Morell river.....		9,008			
Fisher brook-Morell river.....					5,000
Fortune river.....		28,800			
Leard's—Morell river.....		30,000			
McAulay brook-Morell river.....					8,000
McKinnon brook-Morell river.....	38,400	39,300			
McRae's pond-Montague river.....					3,000
Midgell river.....		28,800			
Montague pond.....					4,000
Montague river.....		21,200			
South branch.....		28,800			
Morell river—					
South branch, at Peakes station.....	38,400				
Naufrage river.....		57,600			
North lake.....					6,000
Quigley stream, below mill.....		28,800			
Red bridge-Morell river.....		38,100			
Schooner pond.....		28,800			
Sturgeon river.....		28,800			
Warren's pond.....	38,400				
Whelan brook-Souris river.....		22,800			
<b>Prince Co.—</b>					
Beaton stream-Percival river.....					5,000
Big Pierre Jacques river.....					5,000
Black pond.....		20,000			
Brae river.....					5,000
Doyle stream.....					5,000
Dunk river.....					12,000
Gordon's pond—Kildare river.....					5,000
Green stream-Miminegash river.....		14,400			
Marchbank's pond-Kildare river.....					5,000
Nail pond.....		20,000			
Pridam's pond-Kildare river.....					5,000
Reid's stream (Miminegash).....		19,200			
Rix stream-Kildare river.....					5,000
Smallman stream-Percival river.....					5,000
<b>Queens Co.—</b>					
Bagnall's pond.....				5,000	
Beer's pond-Clyde river.....				5,000	
Callaghan's pond.....					5,000
Clark's stream—East river.....					5,000
Glenfinnan lake.....					
Gurney's stream.....		18,400	11,659		
Hardy's pond.....				5,000	
North river.....		30,000			
McPherson's pond-Flat river.....					5,689
McPherson's pond-Pinette river.....					5,689
Rackham's pond-Wheatley river.....				5,000	
Scott's pond-Clyde river.....				5,000	
Vessey brook-Winter river.....				5,000	4,500
Winter river.....	38,400	12,000			
	192,000	537,608	11,659	30,000	114,878

Total distribution..... 886,145



ALBERTA  
BANFF HATCHERY

	Cut-throat trout eggs	Cut-throat trout finger-lings	Rainbow trout fry	Rainbow trout advanced fry	Rainbow trout finger-lings	Salmon trout finger-lings	Salmon trout advanced fry	Speckled trout finger-lings	Speckled trout No. 2 finger-lings	Speckled trout No. 3 finger-lings	Speckled trout No. 4 finger-lings
—											
Altrude lake.....		10,000									
Baker lake.....		20,000									
Baptiste river—											
Chambers creek.....									40,000		
Lawrence creek.....									10,000		
Ruth creek.....		10,000							20,000		
Betty lake, T. 28 R. 16.....		20,000									
Boom lake.....		30,000									
Bow lake.....											
Bow river—											
Anthracite creek.....		10,000									
Baker creek.....		25,000									
Beaufort creek.....		10,000									
Beaver dam creek.....		10,160									
Big Hill creek.....		30,000									
Cascade creek.....		20,000									
Cold creek.....		20,000									
Eight Mile spring.....		25,000									
Forty Mile creek.....		30,000									
Gap creek.....		5,000									
Gout creek.....		20,000									
Healey creek.....		30,000									
Johnson creek.....		10,000									
Jumping Pound creek.....		10,000									
Backwater creek.....		5,000									
Bear creek.....		10,000									
Coxcomb creek.....		10,000									
Moose creek.....		10,000									
Muskeg creek.....		10,000									
Sibbald creek.....		20,000									
Spring (hatchery) creek.....		5,000						5,000			
Massive creek.....		20,000									
Pinestone creek.....		20,000									
Polliceman creek.....		20,000									
Red Earth creek.....		10,000									
Seven Mile creek.....		5,000									
Spencer creek.....		10,000									
Stundance Lagoon.....		40,000									
Twenty-three Mile creek.....		5,000									
Twenty-nine Mile creek.....		5,000									
Twenty-seven Mile creek.....		5,000									
Carleton lake.....	10,000										
Chimik lake.....		35,000									
Clearwater river—											
Clear creek.....											
North Prairie creek.....									5,000		
Cold creek.....									30,000		
South Prairie creek.....									10,000		
Moose creek.....									30,000		
									10,000		

BANFF HATCHERY—*Concluded*

	Cut-throat trout eyed eggs	Cut-throat trout No. 1 finger-lings	Rainbow trout fry	Rainbow trout advanced fry	Rainbow trout No. 1 finger-lings	Salmon trout No. 1 finger-lings	Salmon trout No. 4 finger-lings	Speckled trout advanced fry	Speckled trout No. 1 finger-lings	Speckled trout No. 2 finger-lings	Speckled trout No. 3 finger-lings	Speckled trout No. 4 finger-lings
Cold lake (border Alberta and Saskatchewan).												
Consolation lake.....		15,000						85,000				
Elbow river—												
Bragg creek.....												
Crawford creek.....					40,000							
Hidden creek.....					5,000							
Lotts creek.....					5,250							
May's creek.....					5,000							
McLean creek.....					15,000							
Mickle creek.....		10,000										
Primez creek.....					5,000							
Ranger creek.....					15,000							
Rennicks creek.....					10,500							
Robinson creek.....					10,000							
Stringer creek.....					5,000							
Sylvester creek.....					10,000							
Thomas creek.....					10,500							
Young creek No. 1.....					5,270							
Young creek No. 2.....					5,000							
Eva lake.....		8,335										
Exshaw lakes.....		40,000										
Ghost lake.....		110,200										
Ghost river—												
Eau Clair creek.....		30,000										
Hay Meadow creek.....		35,000										
Lake creek.....		20,000										
Muskeg creek.....		5,000										
Hector lake.....		50,000										
Herbert lake.....		20,000										
Highwood river—												
Cataract creek.....					20,000							
Etherington creek.....					20,000							
Flatt creek.....					20,000							
Ings creek.....					1,000							
North Sheep creek.....				10,000								
Fisher creek.....				15,000								
King creek.....				5,000								
Ware creek.....				10,000								
Pekisko creek.....												
Greenleaf creek.....					10,000							
Salt creek.....					10,000							
South Sheep creek.....					10,000							
Blue Rock creek.....					20,000							
Canyon creek.....					5,000							
Gorge creek.....					5,000							
Junction creek.....					10,000							
Spring creek.....					20,000							





## JASPER PARK SUB-HATCHERY

	Rainbow trout fry
Beaver dams-McLeod river, T. 47 R. 23 W. 5.....	4,000
Berry creek-McLeod river.....	4,272
Bryon creek-Embarras river.....	5,000
Center creek-Erith river.....	10,000
Chance creek-Embarras river.....	5,000
Crooked creek-Erith river.....	5,000
Deacon lake.....	10,000
Dummy creek-Embarras river.....	5,000
Embarras river, middle forks.....	5,000
Erith river.....	10,000
Horse creek-Sundance river.....	10,000
Little Pembina river.....	5,000
MacKenzie creek-McLeod river.....	5,000
Mary Gregg lake.....	10,000
Mercoal creek-McLeod river.....	5,000
Prospect creek-White Horse creek.....	5,000
Reflection lake.....	10,000
Sanzel lake.....	10,000
Sundance river.....	10,000
Tye creek-McLeod river.....	5,000
Unnamed creek, T. 47 R. 22 W. 5.....	5,000
Watson creek-McLeod river.....	4,000
White Horse creek-McLeod river.....	10,000

157,272

Total distribution..... 157,272

## WATERTON LAKES HATCHERY

	Cutthroat trout advanced fry	Cutthroat trout No. 1 fingerlings	Cutthroat trout eyed eggs	Rainbow trout advanced fry	Rainbow trout No. 1 fingerlings	Rainbow trout No. 2 fingerlings	Rainbow trout No. 3 fingerlings
Belly river—							
Beaver dams (29-1-28, W. 4)	15,000						
Indian creek.....	10,000						
Castle river—							
Beaver dams (10-5-3, W. 5)							
Beaver dams (27-4-3, W. 5)						3,000	
Beaver lake.....					14,500		
Beaver Mines creek					20,000		
Carbondale river.....					35,000		
Gladstone creek.....					20,000	12,000	
Gravenstafle creek					10,000		3,400
Lynx creek.....					5,000		
Mill creek.....					10,000	4,000	
Unnamed creek (7-6-3, W. 5)					25,000		
Unnamed creek (7-5-3, W. 5)					5,000		4,000
Webb creek.....					5,000		
West branch.....					20,000		
Crandal lake.....					2,750		
Crowsnest lake.....				40,000		3,000	
Crowsnest river—							
Blairmore creek.....					20,000		
Byron creek.....					15,000		
Gold creek.....					15,000		
Rock creek.....					15,000		
Star creek.....					5,000		
Livingstone river—							
Coat creek.....	10,000						
Rifle creek.....	10,000						
Twin creek.....	10,000						
Unnamed creek (36-12-4, W. 5)	5,000						
Old Man river—							
Adair creek.....	10,000						
Beaver creek.....	20,000						
Callum creek.....	25,000						
Damon creek.....	5,000						
Ernst creek.....	5,000						
Five Mile creek.....	10,000						
Gap Beaver dam (32-10-3, W. 5)	20,000						
Heath creek.....	15,000						
Mead creek.....	5,230						
North Creek.....	5,000						
Olin creek.....	10,000						

## WATERTON LAKES HATCHERY

	Cutthroat trout advanced fry	Cutthroat trout No. 1 fingerlings	Cutthroat trout eyed yearlings	Rainbow trout advanced fry	Rainbow trout No. 1 fingerlings	Rainbow trout No. 2 fingerlings	Rainbow trout No. 3 fingerlings
Pincher creek.....							
Racehorse creek.....		25,000			30,000		
Sharples creek.....		15,000					
Station creek.....		5,000					
Unnamed creek (30-10-3, W. 5).....		6,000					
Unamed creek (29-10-3, W. 5).....		5,000					
Willow creek—							
Burke creek.....					10,000		
Burton creek.....					10,000		
Chaffin creek.....							
Johnston creek.....				10,000			
Langford creek.....				10,000			
Lyndon creek.....					15,000		
Nelson creek.....				7,500			
North Fork.....				20,000			
One Day coulee.....					5,000		
Patterson creek.....					5,000		
Riley creek.....				5,000			
Trout creek.....					15,000		
Westrup creek.....				7,500			
St. Mary's river—							
Lee creek.....		25,000					
Tough creek.....		25,000					
Waterton lake.....		25,000					
Waterton river—							
Alderson lake.....		6,000					
Beaver dam (32-1-29, W. 4).....			206				
Cameron lake.....		30,000					
Carpenter creek.....					25,000		
Cottonwood creek—							
Beaver dams (1-3-30, W. 4).....		9,000			15,000		
Crooked creek.....							
Drywood creek.....				63,820	20,000		
Beaver dams (14-4-1, W. 5).....						3,000	
Elroy creek.....					5,000		
Lone brook.....		4,500					
Lost lake.....	6,000						
Pass creek.....	5,000						
Beaver dams (22-2-2, W. 5).....		4,500					



Beaver dams (32-1-29, W. 4).....	2,000				
Beaver dams (25-2-2, W. 5).....	5,000				
Beaver dams (1-2-2, W. 5).....	5,000				
Spring creek.....				15,000	
Stoney creek.....	5,000				
Beaver dams (34-1-29, W. 4).....	4,000				
Trail creek.....					3,760
Yarrow creek—					
South Fork.....			52,214		
Beaver dams (13-3-1, W. 5, 35-3-30, W. 4, 26-3-30, W. 4).....				115,000	
	36,000		116,034		
		£ 06		417,250	31,760
					7,400
Total distribution.....					1,094,880

## DEPARTMENT OF FISHERIES

BRITISH COLUMBIA  
ANDERSON LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry	Spring salmon fry	Spring salmon No. 3 fingerlings
Anderson river.....			92,903	23,915
Anderson lake—				
Adlem creek.....		594,000		
Boulder creek.....		594,000		
Cabin creek.....		594,000		
Cedar creek.....		594,000		
Clemens creek.....	1,472,440	687,000		
Eight Mile beach.....		594,000		
Fall creek.....		594,000		
Four Mile beach.....		594,000		
Ternan creek.....		52,121		
	1,472,440	4,897,121	92,903	23,915

Total distribution..... 6,486,379

## ARGENTA SUB-HATCHERY

	Kamloops trout fry
Kootenay lake—	
Argenta slough.....	250,000
Big slough.....	100,000
Schroeder bay.....	65,000
West shore.....	53,800
	468,800

Total distribution..... 468,800

## BABINE LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry	Sockeye salmon No. 1 fingerlings
Morrison creek.....	1,546,030		879,945
Morrison lake.....		1,998,873	
Beaver lagoon.....		750,000	
Salmon river.....		1,000,000	
	1,546,030	3,748,873	879,945

Total distribution..... 6,174,848

## BEAVER LAKE EYEING STATION

	Kamloops trout eyed eggs	Kamloops trout fry
Beaver lake.....		80,185
Crooked lake.....		60,000
Crooked creek.....	150,000	
Echo creek.....	155,000	
Dee lake.....	100,000	
Deer lake.....		80,000
Island lake.....		80,000
Kelowna rearing ponds, Kelowna Rod and Gun Club.....	150,000	
Vernon rearing pond, Vernon Angling Club.....		30,000
	555,000	330,185

Total distribution..... 885,185

## COWICHAN LAKE HATCHERY

	Atlantic salmon year- lings	Brown trout No. 1 finger- lings	Brown trout No. 3 finger- lings	Brown trout No. 4 finger- lings	Brown trout year- lings	Coho salmon eyed eggs	Coho salmon fry
Campbell river—							
Quinsam river.....					17,002		
Cowichan lake.....	4,803		11,100	15,589	11,718		490,673
Cowichan river.....						25,000	
Beadnall creek.....						25,000	
Oliver creek.....						150,000	
Goldstream river.....		67,277					
Qualicum ponds (Provincial).....							
Veitch creek, retaining ponds (Provincial).....							
	4,803	67,277	11,100	15,589	28,720	200,000	490,673

	Spring salmon eyed eggs	Spring salmon fry	Spring salmon No. 1 finger- lings	Spring salmon No. 2 finger- lings	Steelhead salmon No. 2 finger- lings	Steelhead salmon No. 4 finger- lings
Campbell river—						
Quinsam river.....	75,000	35,000				
Cowichan lake.....		108,736				
Cowichan river.....		112,000	76,817	27,900	34,721	
Beadnall creek.....						
Oliver creek.....			159,260			
Goldstream river.....						
Qualicum ponds (Provincial).....						
Veitch creek, retaining ponds (Provincial).....						31,661
	75,000	255,736	236,077	27,900	34,721	31,661

Total distribution..... 1,479,257

## CULTUS LAKE HATCHERY

	Cut- throat trout eyed eggs	Cut- throat trout fry	Sockeye salmon green eggs	Sockeye salmon eyed eggs	Sockeye salmon No. 1 finger- lings	Steelhead salmon No. 1 finger- lings	Steelhead salmon No. 2 finger- lings
Atchelitz creek.....		5,000					
Cultus lake—							
Smiths Falls creek.....				407,327			
Spring creek.....				2,715,553			
Watt creek.....				1,456,000			
Windfall creek.....				1,085,000			
Davis lake.....	35,000						
Echo lake.....		8,000					
Hatchery creek—Sweltzer creek.....			53,284				
Hatzic lake.....	20,000						
Little Sumas river.....		15,000					
Liumchin creek.....						6,000	
Long Island lakes.....		8,401					
Popkum lake.....		13,000					
Sweltzer creek.....					47,936	30,000	26,568
Wells ponds, Sardis (A. E. Wells & Son).....						500	
	55,000	49,401	53,284	5,663,880	47,936	36,500	26,568

Total distribution..... 5,932,569



## HARRISON LAKE SUB-HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry
Harrison lake—		
Cascade bay.....		2,750,000
Cascade bay to Fifteen Mile creek.....		350,000
Cottonwood bay.....		1,750,000
Cottonwood bay to Eagle creek.....		450,000
Crowhurst bay.....		1,900,000
Eagle creek.....	250,000	
Eagle creek to Twenty Mile bay.....		500,000
Echo island.....		700,000
Fifteen Mile creek.....	1,517,440	300,000
Fifteen Mile creek bay.....		500,000
Hatchery creek.....	390,000	368,000
Hatchery creek bay.....		826,612
Ten Mile creek.....	315,310	
Ten Mile creek bay.....		700,000
Silver creek.....	3,633,505	1,250,000
Harrison river—		
Morris creek.....		1,450,000
Weaver creek.....	5,512,585	
	11,618,840	13,794,612
Total distribution.....	25,413,452	

## KENNEDY LAKE HATCHERY

	Sockeye salmon green eggs	Sockeye salmon eyed eggs	Sockeye salmon advanced fry	Sockeye salmon No. 1 finger-lings	Sockeye salmon No. 2 finger-lings	Sockeye salmon No. 3 finger-lings	Sockeye salmon No. 4 finger-lings
Kennedy lake.....			240,000			63,255	
Clayoquot Arm—							
At hatchery.....	30,000						
Clayoquot river.....		515,980					
Cosy bay-Narrows.....				120,000			
Deer beach-Grassy bay.....					50,000		
Duck island-Cougar bay.....				240,000	29,988		
Hatchery beach.....					10,000		
Little Pond creek.....				65,000		5,000	
Log bay-Yew creek.....			200,000	150,000			
Martincreek-Petercreek..				80,000			
Pond beach.....				120,000	250,000	10,000	19,836
Pond creek.....				40,000	20,000		
Rocky bay.....				200,000			
Silent bay and vicinity..				200,000	59,990		
Silent bay-Narrows.....				240,000			
Alberni bay.....				213,810			
Angora creek-High Point.....				100,000			
Charlie creek-Ucluelet bay.....			440,000				
Deer beach-Brewster beach.....				120,000			
Draw creek.....		419,180					
Grant creek and north.....					334,942		
Grant creek and south.....				170,000			
Halfway point-High point.....				246,969			
Long island-Shallow bay.....				240,000			
Long island bays.....				75,609			
Narrows-Halfway point.....				360,000			
Sand river vicinity.....			200,000	150,000			
Shallow bay-Norger bay.....			240,000				
Snag bay-Sandy bay.....			200,000	240,000	109,982		
Ucluelet bay.....			200,000	220,000			
Kennedy river.....			160,000		150,000		
Olsen bay.....						20,857	
Sutton's slough.....					9,888		
Muriel lake—							
David creek.....		390,845					
Donald creek.....		295,575					
Upper Kennedy river.....		325,875					
	30,000	1,947,455	1,880,000	3,591,388	1,024,790	99,112	19,836
Total distribution.....					8,592,581		

## LAKELSE LAKE HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry	Sockeye salmon No. 5 finger- lings
Lakelse lake.....		3,542,999	168
Granite creek.....	1,019,200	535,460	
Salmon creek.....	883,010	299,000	
Scullabuchan creek.....	3,460,800	1,499,001	
Williams creek.....	1,770,400	1,749,000	
Eliza creek.....	810,495		
	7,943,905	7,625,460	168
Total distribution.....		15,569,533	

## LLOYD'S CREEK SUB-HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry
Hope district—		
Big Bar lake.....	20,000	
Coquihalla river.....	25,000	
Haig lake.....	10,000	
Kelly lake.....	20,000	
Pavilion lake.....	30,000	
Silver lake.....	20,000	
Kamloops district—		
Andy lake.....		2,000
Beaver lake.....		5,000
Eleanor lake, near Blue river.....		5,000
Fish lake.....		250,000
Knouff lake.....		150,000
Latremoville lake, near Mt. Olie.....	15,000	
Little Boggs lake, near Mt. Olie.....	20,000	
McConnell lake.....		4,549
Paul lake.....		200,000
Pillar lake.....		8,000
Pinanta lake.....		150,000
Red lake.....		50,000
Unnamed lake, near Pritchard.....		1,320
Link lake, near Ocean Falls.....	75,000	
Prince George district—		
Cluculz lake.....	20,000	
Laselle lake.....	10,000	
Moose lake.....	30,000	
Small lake.....	10,000	
Yellowhead lake.....	20,000	
Revelstoke Rod and Gun Club, Biological station, Taft.....	100,000	
Salmon Arm district—		
Gardiner lake.....		2,000
Loon lake.....		5,904
McGuire lake.....		4,000
Shuswap district—		
Canoe creek-Shuswap lake.....	45,000	
Granite creek-Shuswap lake.....	60,000	
Palmer creek-Salmon river.....	45,000	
Reineckers creek-Shuswap lake.....	60,000	
Salmon river.....	60,000	3,000
Shuswap lake.....		64,902
White lake.....		5,000
Stanley Park hatchery.....	325,000	
Vancouver district—		
Cannall lake.....	21,000	
Norton lake.....	25,000	
Powell lake.....	30,000	
Wells ponds, Sardis (Oliver Wells, Esq.).....	500	
Vancouver island—		
Cameron lake.....	35,000	
Great Central lake.....	65,000	
Lower Campbell river.....	30,000	
O. K. lake, near Nanaimo.....	15,000	
Quamichan lake.....	10,000	
Shawnigan lake.....	25,000	
Sproat lake.....	65,000	
Telford creek-Shawnigan lake.....	20,000	
Unnamed lake, near Nootka.....	15,000	
	1,375,500	910,675

Total distribution..... 2,286,175

## NELSON HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry	Kamloops trout No. 5 fingerlings	Ken- nerly's salmon eyed eggs	Ken- nerly's salmon fry	Speckled trout eyed eggs	Speckled trout fry
Creston district—							
Meadow creek-Goat river..						30,000	
Private pond, Mr. T. M.							1,000
Edmondson, Creston.....							
Grand Forks district—							
Christina lake.....	30,000						
Sander creek.....				150,000			
Smelter lake.....	20,000						
Greenwood district—							
Boundary creek-Kettle river.....						35,000	
Collier lake.....	20,000						
Jewel lake.....		20,000					
Loon lake.....		5,000					
Wallace lake.....		5,000					
West Kootenay—							
Arkansaw lake.....	10,000						
Arrow lake, lower (at Sy- ringa creek).....		26,750					
Arrow lake, lower (at Edge- wood).....	20,000						
Arrow lake, upper.....	16,923						
Barret lake.....	5,000						
Bayonne lake.....	10,000						
Bear lake.....	10,000						
Beatrice lake.....	20,000						
Beaver creek.....							25,000
Big Sheep creek.....							40,000
Boundary lake.....							40,000
Box lake.....	10,000						
Cahill lake.....	15,000						
Corn creek.....						30,000	
Cottonwood lake.....		40,000					
Crawford bay retaining pond (Capt. Hincks).....		1,500					
Devil's Hole lake.....	10,000						
Erie lake.....							25,000
Flint lake.....	8,000						
Haiselden lake.....	10,000						
Hidden creek.....	15,000						
Inonoaklin river.....							30,000
Kaslo creek, south fork.....							32,539
Kokanee creek.....				100,000	200,000		
Kootenay lake, west arm.....		47,298	85				
Kootenay river.....		25,000					
Little Slokan lakes.....							30,000
Loon lake.....							25,000
Noakes lake.....	10,000						
Redfish creek.....					55,000		
Six Mile creek.....					81,870		
Six Mile lake.....		30,000					
Slokan lake.....				75,000			
Slokan pool.....		30,000					
Slokan river.....	20,000						
Summit lake.....	8,000						
Whatsan lakes.....	20,000						
Westminster district—							
Jones lake, near Hope.....				50,000			
	287,923	230,548	85	375,000	336,870	95,000	248,539

Total distribution..... 1,573,965



## PEMBERTON HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry	Sockeye salmon fry
Alta lake.....		59,750	
Birkenhead river.....			19,309,300
Horse lake-Quesnel district.....	20,000		
Lac La Hache.....	20,000		
Lost lake-Cheakamus river.....		4,950	
McLeese lake-Quesnel district.....	20,000		
Millburn lake-Quesnel district.....	15,000		
Ten Mile lake-Quesnel district.....	15,000		
	90,000	64,700	19,309,300

Total distribution..... 19,464,000

## PENASK LAKE SUB-HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry
Cranbrook hatchery (Cranbrook Rod and Gun Club).....	141,000	
Jackson lake.....		10,000
Mystery lake.....		5,000
Neveu lake.....		5,000
Nicola river.....	10,000	
Penask lake.....		212,902
Mud lake.....		20,000
Peterson lake.....		5,000
	151,000	257,902

Total distribution..... 408,902

## PITT LAKE HATCHERY

	Kamloops trout No. 5 fingerlings	Sockeye salmon eyed eggs	Sockeye salmon fry	Sockeye salmon No. 2 fingerlings
Pitt river—				
Cox's slough.....		690,000	570,000	
Charles Peter's creek.....			420,000	
Four Mile creek.....	826	900,000	601,940	59,944
Four Mile slough.....			720,000	
Mountain slough.....			480,000	
Seven Mile creek.....		590,000	765,000	
	826	2,180,000	3,556,940	59,944

Total distribution..... 5,797,710

## QUALICUM BEACH PONDS (PROVINCIAL)

	Brown trout No. 1 fingerlings	Brown trout No. 2 fingerlings	Brown trout No. 3 fingerlings	Brown trout No. 4 fingerlings	Brown trout No. 5 fingerlings	Brown trout yearlings	Kamloops trout No. 1 fingerlings	Kamloops trout No. 2 fingerlings	Kamloops trout No. 3 fingerlings
Biological Research.....	330	150	252	100	200	350	37	25	25
Cowichan river.....						6,500			
Little Qualicum river.....						10,000			
Arrowsmith slough.....						18,635			
Buller creek.....						1,500			
Chatsworth creek.....						14,621			
Lockwood creek.....						8,500			
Spencer creek.....						6,518			
Whiskey creek.....						17,547			
	330	150	252	100	200	84,171	37	25	25

Total distribution..... 85,290

## RIVERS INLET HATCHERY

	Sockeye salmon eyed eggs	Sockeye salmon fry	Spring salmon fry	Spring salmon No. 1 fingerlings
Owikeno lake.....				59,861
Askum creek.....		598,690		
Cheo river.....		821,240		
Dallick river.....		600,000		
Genesi creek.....	1,300,000	799,760		
Indian river.....		795,760		
Markwell river.....		586,600		
Madowse creek.....			119,780	
Nookins river.....	570,000			
Quap creek.....	302,778	2,109,003		
Second Narrows.....			198,360	
Shumahault river.....	1,241,000	812,890		
Wauquash river.....		821,240		
	3,413,778	7,945,183	318,140	59,861

Total distribution..... 11,736,962

## SMITHS FALLS SUB-HATCHERY

	Kamloops trout fry	Sockeye salmon eyed eggs	Sockeye salmon No. 5 fingerlings
Biological Board.....		10,000	
Cultus lake.....			93,551
Devil lake.....		8,000	
Grace lake.....		18,000	
Wolf lake.....		17,706	
	43,706	10,000	93,551

Total distribution..... 147,257

## SPROAT RIVER EYEING STATION

Somass river:—	salmon
Stamp river—Alberni district.....	Spring
	eyed eggs
	316,435
Total distribution.....	316,435

## SUMMERLAND SUB-HATCHERY

	Kamloops trout eyed eggs	Kamloops trout fry
Bolean creek-Salmon river, Falkland.....		30,000
Clearwater lake-Salmon river, Keremeos.....	30,000	
Okanagan district—		
Chute lake.....		10,000
Chute creek.....	30,000	
Deep creek.....	30,000	
Eneas lake.....		10,000
Ellis creek dam.....		10,000
Fish lake-Summerland.....		10,000
Garnet Valley lake.....		5,000
Glen lake.....		10,000
Kalamalka lake.....		30,000
Kelowna rearing ponds (Kelowna Rod and Gun Club).....		150,000
McLean creek-Dog (Shaha) lake.....	60,000	
Okanagan lake.....		234,379
Osoyoos lake.....		10,000
Peach Orchard creek.....	218,193	
Silver lake.....		10,000
Woods lake.....		30,000
Shuswap district—		
Hidden lake.....		10,000
Mabel lake.....	120,000	
Sugar lake.....	90,000	
Similkameen river—		
Davis lake.....		15,000
Island lake.....		10,000
Osprey lake.....		10,000
Otter lake.....	60,000	
Princeton rearing ponds (Princeton Rod and Gun Club).....		30,000
Taylor lake.....		5,000
Wolfe lake.....	60,000	
	698,193	629,379

Total distribution..... 1,327,572



## APPENDIX No. 4

### REPORT OF INSPECTION OF FISH AND PACKAGES AND TECHNICAL INSTRUCTION TO FISHERMEN

BY J. J. COWIE, DIRECTOR

#### INSPECTION OF SALTED HERRING, MACKEREL, ETC.

What is known as the Fish Inspection Act requires that all containers used for packing and marketing such fish as come under the provisions of the Act must be made and marked in accordance with the regulations authorized under the Act and that all such containers must be inspected and marked by a duly authorized officer before being bought, sold, or used; and further that all such fish as come under the provisions of the Act must be cured, graded and packed in accordance with the requirements of the regulations and inspected by an inspecting officer before being sold, bought or shipped.

During the year 1935-36 those fishery officers, who were qualified and authorized, carried on the inspections in addition to their other duties as fishery officers.

#### ATLANTIC COAST

On the Atlantic coast there were inspected 78,512 empty barrels and packages. A number were found to have small defects which were at once remedied at the cooper shops and allowed to pass into the industry. There were 40,508 barrels of mackerel and 24,261 barrels of herring inspected. Of smoked round herring there were inspected 376,185 boxes. Of alewives there were 8,326 barrels inspected and of oysters there were inspected 19,279 packages.

In addition to inspecting barrels at cooper shops and inspecting fish at fish curing places, the fishery officers inspected all fish curing establishments to see that these were being operated under proper sanitary conditions.

#### PACIFIC COAST

The fishery officers on the Pacific coast, who are qualified and authorized to do so, conduct the inspection of dry salted herring. These are roughly salted, placed in boxes and do not call for much skill in the curing. The duty of our officers is to see that the fish will be in salt for a sufficiently long time to properly preserve them, and that the standard boxes are filled to capacity.

China is the only market for this product and owing to the very unsettled conditions there and the difficulties in connection with exchange, a limited quantity only was allowed to be packed during the season of 1935-36 by the marketing board that had been established to regulate shipments with a view to preventing the losses that had been borne by shippers in preceding years.

The package used is a strong box containing four hundred pounds of salted herring. During the season 72,162 boxes were inspected.

#### INSPECTION OF CANNERIES AND CANNED FISH

The Meat and Canned Foods Act requires that all fish and shellfish canneries shall be inspected as provided by the regulations made under the authority thereof. Also, that all fish and shellfish packed in cans shall be subject to such inspection as may be provided by the regulations during the course of preparation and packing and at any time thereafter at the cannery or at the warehouse of the first purchaser. The Act requires also that the labels placed on the cans

must show the full name and address of the packer or of the first dealer obtaining the cans direct from the packer, a true and correct description of the contents of the can and the weight of the contents.

The Act and the regulations thereunder were designed with a view to:—

- (1) The extension of trade by improving the quality of the product.
- (2) The protection of the public by preventing the packing of unsound fish and insisting on the labels bearing the correct designations.

During 1935-36 the fishery officers of the department carried on the inspections under the Act named. In that year there were operated in the Provinces of Nova Scotia, New Brunswick, Prince Edward Island, British Columbia and in the Magdalen Islands 266 lobster canneries, 44 salmon canneries, 13 clam canneries, and 17 other canneries where sardines and small quantities of shrimp, crab and other fish were canned.

Under the scheme for raising the standard of lobster canneries on the Atlantic Coast by assigning marks to each for construction and equipment and for operating methods and cannery sanitation, which was introduced a few years ago, grading was continued by the inspecting officers last year with marked results in improved conditions.

Particular attention was given to the weights of lobster meat packed in the cans and many tests were made throughout the season and all cans found to be underweight were so stamped.

Since the year 1932 a special inspection of canned salmon is conducted on the Pacific Coast. The inspection requires:—

- (1) That no canned salmon is to be shipped out of the province without inspection.
- (2) That parcels of canned salmon found to be fresh, firm and well packed are given an official certificate of approval.
- (3) That parcels of canned salmon found to be sound and fit for human food but not quite up to the standard required for a certificate are classed as "second quality."
- (4) That parcels falling below second quality are confiscated and destroyed, or used by the department for purposes other than human food.

When this inspection was started there was some difficulty in finding suitable properly qualified men who would be acceptable both to the Department and the industry to carry on the inspection. It was ultimately agreed, therefore, that an independent board of three inspectors be appointed. It was further agreed that three highly qualified men who were connected with the canned salmon business as brokers or buyers and had experience in inspecting all classes of canned salmon for trade purposes should be appointed to form the inspection board. Since the inauguration of the canned salmon inspection system these men have performed the duty of inspecting all British Columbia salmon with integrity and with fairness to all concerned.

Admittedly this arrangement, however, was a more or less temporary one, as in the course of time canners who were unfortunate enough to have parcels of canned salmon placed in the second quality class or even in the third class were bound to harbour the feeling that they were being discriminated against by inspectors who were interested in the buying and marketing of the product they were inspecting.

As a result of a growth of this feeling it was decided in the course of the year under review to disband the board and appoint independent inspectors who would be entirely free from trading in the product and who would have the necessary qualifications to conduct the inspections on something of a scientific basis beginning on the first of April, 1936. All the preliminary steps were taken therefore during the season to bring this about on the first of April with as little friction and ill-feeling as possible.



During the past year there was also objection made by a section of the canners to the use of the terms "second quality" on cans of that grade. It was, therefore, decided, after consulting the industry, to substitute the term "Grade B" for "second quality," also there was objection to the fact that there was no appeal from the decision of the board, that is, while there was an appeal from the decision of one inspector to the full board, the appeal did not go beyond the board. It was, therefore, decided to set up a means of appealing decisions of the board to an outside body consisting of three qualified persons, one to be selected by the Chairman of the Canners' Association, one by the Chief Supervisor of Fisheries for British Columbia and one by the appellant. Such a board of appeal was therefore established and put in operation during the course of the season last year.

Under this inspection of canned salmon 1,490,851 cases were inspected in the calendar year 1935. Of that quantity 1,447,024 cases were found to be of the required quality and entitled to the certificate of approval provided by the regulations. There were 41,625 cases found to be below the standard required for a certificate and marked "second quality" or "Grade B," and 2,073 were tips and tails. There were 129 cases found to fall below the second quality grade and these were confiscated and destroyed.

#### INSTRUCTION IN FISH CURING

During the year under review the department carried forward the work of instructing fishermen on certain parts of the Atlantic Coast where such instruction was asked for in the curing of cod in pickle and the making of boneless fish, also in the Gaspé style of curing and drying cod.

#### COD CURING IN PICKLE

This work last year was extended to a number of new places in the eastern mainland of Nova Scotia. These included Caribou, Pictou County and Ingonish, Neil's Harbour, Dingwall, Chéticamp and Chéticamp Point, Grand Etang and Margaree Harbour in Cape Breton Island.

In addition to the actual work of demonstrating the splitting and salting of the fish, our instructors in some places had also to demonstrate to fishermen how to set up their gear and how to handle it in their boats and on the fishing grounds in order to enable them to produce fish of the quality necessary for the curing of cod in pickle and the boneless trade. Notwithstanding rather depressed market conditions pickle cured codfish, prepared under the guidance of our instructors and with their advice rigidly followed, were sold last year at an advance of one dollar a hundredweight over the prices paid at places where our instructors had not before been at work.

In Prince Edward Island where fishing methods are not quite conducive to the production of the best quality for this particular cure, it was noted that with more careful curing prices advanced forty or fifty cents per hundredweight.

Satisfactory progress has continued at all the stations or curing places that were covered by our instructors in previous years.

The manufacture of boneless fish was undertaken as a new thing at Ingonish, Caribou, Point Aconi, Petit de Grat, Liscomb, Marie Joseph, Lower LaHave and Lockeport. The product of these places was marketed in Canada. In this way the established trade in boneless fish with the United States from western Nova Scotia was not interfered with.

As this work proceeds the department is being requested for more and more help of this nature, consequently, the number of instructors will surely have to be increased if the requests from fishermen and fish curing firms are to be met.



## GASPE COD CURING

Two qualified instructors in the curing of cod in the Gaspé style were again employed during the season to give instruction. One operated at the Magdalen Islands and the other in the County of Gloucester, New Brunswick.

The instructors visited the landing places of the fishing boats each day as far as possible and gave instruction to the fishermen on the spot in the proper splitting, washing and salting of fish for this style of curing. Then when the time came for drying the fish they visited the drying places giving instruction in and supervising the methods of drying. Later when the dried fish came to be graded for shipment, they took part in this work and advised as to the proper grading.

At the Magdalen Islands the instructor visited regularly Aurigny, Premier Etang, Basin Cove, Etang du Nord, Cabin Cove, Hospital Cove, Pointe Basse, Grindstone, Belle Anse, Grand Entry, Grosse Isle, Brion Island, West Cape, Pointe du Loup, Amherst Harbour, Old Harry's Cove and Big Cape.

In Gloucester County the places regularly visited were Savoy Landing, Shippegan Island, Cape Bateau, Coteau Road, Upper Lameque, Island River, Pigeon Hill, Little Shippegan, Miscou Harbour, Miscou Centre, Wilson's Point, Grandes Plaines, Point Alexander, Ste. Cécile, Point Canot and the caraquets.

## EDUCATIONAL COURSES OF INSTRUCTION

Again under an arrangement with the Biological Board of Canada a course of instruction was given to fishermen at the Board's Fisheries Experimental Station at Halifax, Nova Scotia.

Owing to continued shortage of funds the Board was unable to give a course extending to six weeks as in the past. The one now being reported on extended therefore for three weeks from the thirtieth of January. The course was advertised in the usual way in the Maritime Provinces. Applicants for admission to the course were required to be bona fide fishermen from seventeen to thirty-five years of age who had passed through grade six, or an equivalent grade, in the public schools of the Maritimes. One hundred and ten applications for instruction were received. Of these twenty were accepted. All of the twenty attended the course. In addition one who was not actually a fisherman took the course and paid his own way. The classes began each day at 9.00 A.M.; afternoon session began at 2.15 to 5.00 P.M., and sometime classes were held in the evening.

The subjects taught were chiefly those having a practical bearing on the operations of fishermen. Instruction was given in the preparation of pickled fish such as mackerel, herring, etc., also in the making and coopering of barrels. The class was also instructed in the preparation of pickle cured cod and in the production of boneless fish. Instruction was also given in the mechanism of motor engines and their care in operation. Instruction in the rudiments of navigation was also given the fishermen. While these practical things were emphasized during the course, some scientific knowledge of fish life in the sea and the effect on fish migration of such agencies as temperature, salinity, wind and currents was given by the Biological Board's staff of the Fisheries Experimental Station.

In the year under review a start was made in extending instruction to fishermen in the southern part of British Columbia.

The Biological Board's staff at its station at Departure Bay made arrangements to give a course of instruction at Nanaimo, British Columbia, to fishermen who found it convenient to attend. Instruction was given during a period of four days from February tenth to thirteenth inclusive in the Legion Hall at Nanaimo. Twenty-six fishermen took advantage of the course and attended

regularly. They came from Nanaimo mainly, but also from Vancouver, Courtenay, Lasqueti Island, Victoria, Gabriola Island and Bowser. Most of the fishermen attending engaged in trolling for salmon, and some made their living at ling cod fishing, and some others were chiefly interested in herring fishing. The course of instruction was therefore drawn up with a view to giving information to all the types of fishermen who attended.

The subjects of instruction included pilchard, herring, life history of salmon, life history of halibut, fishes in the waters off the coast of British Columbia, nutritive value of salmon, ocean conditions, certain phases of the conservation of fish, and wood borers. Lectures were given in the forenoon, afternoon and evening of each day.

At the conclusion of the course the interest and satisfaction of the fishermen in the instruction given was reflected in a movement to endeavour to have another such course some time in the fall of the year and to interest the members of the various fishermen's associations with a view to securing a greater attendance at the next course.

## APPENDIX No. 5

### ENGINEERING BRANCH

*Report by Charles Bruce, A.M.E.I.C., Fisheries Engineer*

The Engineering Branch of the department is responsible for all works of a technical nature undertaken by it in the Maritime Provinces and British Columbia in which the fisheries are administered by the federal government. In addition to undertakings coming directly under the department, the work carried on includes assisting and co-operating with fish and game associations by advising, conducting surveys and providing designs for the establishment by them of hatcheries and rearing ponds; the design and supervision of construction of bait freezers built by fishermen's associations or others; the design and supervision of construction of fishways built by the owners of dams and the supervision of the leasing of areas for oyster culture in Prince Edward Island which comes under departmental administration. Where obstructions to the ascent of fish, due to accumulations of débris and trees, brought down by freshets, occur in smaller streams the usual practice is to require the fishery inspector to investigate the conditions and provided action is deemed necessary the work is performed under his supervision.

The outstanding feature affecting the conditions of streams in British Columbia this year was an abnormal freshet occurring in February, which caused forest slides, erosion of river banks, and a general disturbance of the gravel beds of rivers, in consequence of which new obstructions were formed and in some cases partial obstructions added to, causing apprehension in many instances that the upstream migration of fish might be interfered with. In this province two departmental patrol boats have been equipped with the necessary tools and the crews can deal with minor obstructions and thus not only expedite the work but obviate the need for employing additional labour.

All work of the branch in British Columbia is under the direct supervision of Resident Engineer John McHugh, with headquarters at Vancouver.

#### BUILDING FISHWAYS AND CLEARING RIVERS

##### NOVA SCOTIA

*Tusket River, Yarmouth County.*—After taking up the matter with the Nova Scotia Power Commission, owners of the dam at Carleton lake on this river, it was decided to defer completion of the fishway there until an opportunity for a further survey occurred. This survey was completed and information obtained for modification of the design prepared during the previous year.

*Hipsons Brook, Yarmouth County.*—An inspection of this stream revealed that some of the channelling through boulders which was done some years ago had fallen in. This was cleared out, together with several small obstructions.

*Salmon River, Yarmouth County.*—Following an inspection several places on the lower reaches of this river were channelled to facilitate the ascent of salmon during the late spring months after the freshet subsides. A stone barrier was built at the outlet of lake Doucette, about half a mile from the mouth of the river, to retard the freshet run-off and thereby improve water conditions in the lower river over a more extended period.

*Birchtown Brook, Shelbourne County.*—Following an inspection of this brook, which revealed that its bed in some stretches was so full of boulders that



fish could not ascend after high water had subsided, clearing was done to improve this condition and confine the water to a definite channel.

*Roseway River, Shelburne County.*—The bed of this river was cleared of boulders between the foot of the hydroelectric dam and the lower end of the tailrace to confine the water to a definite channel for the ascent of fish, and a back channel which was taking part of the flow was blocked with a boulder wall.

*Jordan River, Shelburne County.*—Since the headwaters of this river were diverted into the Mersey river, the run-off has been reduced and in order to improve conditions for the ascent of salmon some channelling to confine the water was carried out.

*Medway River, Queens County.*—The channel through Salter's falls, which was opened by the department several years ago to facilitate the ascent of salmon, was found on inspection to have become somewhat filled in from ice runs of the previous winter. This was properly cleared out and in addition a log and stone buttress was built to protect the wall of the fishway in the dam at that place, where it extends into the pond above.

*LaHave River, Lunenburg County.*—Some work to improve conditions at the fishway in the Wentzell dam on this river was completed.

*Margaree River, Inverness County.*—Following an inspection of a situation on this river where it appeared that due to erosion of the banks it might break through into Lake O'Law brook and destroy a considerable area of spawning grounds, some obstructions in the way of large trees, brush, etc., which had become lodged at the danger point, were removed.

*Little Salmon River, Halifax County.*—An inspection of a dam being built on this river was made and the owner instructed regarding the provision of a fishway after the necessary data had been secured.

*Tangier River, Halifax County.*—Surveys for the design of fishways in the power and storage dams on this river were conducted, and a design to cover the former case was subsequently prepared.

*Dartmouth Lakes, Halifax County.*—An inspection to determine the feasibility of providing fishways to enable fish to reach the Dartmouth lakes was made. The work would involve several fishways to overcome the different levels due to dams and the old locks of the Dartmouth-Shubenacadie canal. The expenditure would be considerable and probably out of proportion to the value of the fishery.

*Terence Bay Brook, Halifax County.*—A survey was made to secure data for the improvement of a small fall on this stream.

*Sackville River, Halifax County.*—A survey was made at McCabe's lake to determine the cost of re-establishing an old storage dam which, previous to its demolition, afforded some regulation of the flow of the river.

*Grand River, Richmond County.*—The old fishway at the falls on this river was inspected and a survey conducted which would enable the reconstruction of the upper section to be planned, should this later be considered necessary. An inspection was also made of portions of the river above the falls for the selection of a site on which to place a trap to establish whether or not salmon were ascending.

At the following locations obstructions of a minor nature, which investigations by the fishery inspectors revealed would prevent the free passage of fish, were removed:—

Wallace brook, Lunenburg county.  
Branch brook, Lunenburg county.  
McDonalds creek, Cape Breton county.  
Black brook, Cape Breton county.  
Trout river, Inverness county.  
Captain Johns brook, Inverness county.  
Strathlorne brook, Inverness county.  
Shubenacadie river, Hants county.

Inspections were made of alleged obstructions in several streams in Inverness county including, Rough, Boyds, Maple and McCall's brooks, while a survey was made for the design of a fishway in a small dam on Bridgend brook.

#### NEW BRUNSWICK

*Magaguadavic river, Charlotte county.*—The gates in the fishway at St. George on this river were renewed and a trap established at the head of the fishway to obtain a count of the ascending fish, a total of 316 salmon were counted through and released into the river above. While this is not to be regarded as a large number it is encouraging in view of the fact that no fish at all got up this river until 1932.

*Chamcook lake, Charlotte County.*—An inspection was made to obtain information for the design of a rack to prevent the descent of landlocked salmon from this lake. As the season was advanced, a temporary wire netting screen was established for the time being.

*Black River, Kent County.*—A survey was made to secure the necessary information for the design of a fishway in a small dam in this river and plans were subsequently prepared.

*Salmon River, Albert County.*—An inspection was made to ascertain what modifications would be needed to improve a fishway in an old dam on this river.

*Point Wolfe River, Albert County.*—A survey to secure information for the design of a fishway in a dam on this river was conducted. On completion of the plans it was found that the possibilities for providing a fishway were most unfavourable and that the cost would probably be out of proportion to the value of the river to the fisheries.

*Bartholomew River, Northumberland County.*—A survey was made to secure information for modifications of the gates in a dam on this river to permit salmon to ascend. While such provision was found to be feasible the work was not recommended as an investigation showed that the fishery was not suffering any damage through this obstruction.

*Aroostook River, Victoria County.*—On the request of interested persons in the State of Maine an engineer inspected the large dam on this river which is located almost on the boundary between New Brunswick and Maine. Those interested had secured a grant from the state government to provide a fishway for salmon and desired advice as to the best means of proceeding. The work was subsequently completed but too late for that season's run of salmon.

## BRITISH COLUMBIA

*Gull Chuck River, Bella Bella District.*—Work was carried out to improve the rock falls situated about one-quarter of a mile upstream from the mouth. The falls constitute a 10 foot drop extending over a width of river of 75 feet. Certain work had been done on these falls in 1923, but owing to erosion of the rock the upper section of the steps cut had been obliterated. This year further steps were cut and leads cut in the rock bed of the crest to convey the water to this passage at low flows. A very satisfactory report of the result of this work has been received from the inspector of the district.

*Nanoose Creek, Vancouver Island.*—The February freshet caused a mud slide which deposited alder trees and a mass of intertwining roots in this stream, thus forming a complete blockade to the run of salmon, which consists of cohoes and chums. The obstruction was satisfactorily removed and the material placed on the banks clear of high water.

*Chemainus River, Vancouver Island.*—A large log jam in this river, extending over one-quarter of a mile of the river bed, was formed in the February freshet. This was inspected by the resident engineer on two occasions and the conclusion arrived at that at the present time there was sufficient passage for fish under the jam, and no work would be required unless further observation determined a blockade.

*Atnarko River, Bella Coola District.*—A large log jam, situated at Turner flats, three miles above Atnarko P.O., was cleared out in May. This obstruction consisted in the main of a compact jam of logs and debris in the river and had the effect of splitting the river into four or five small streams, which, during summer water levels, flowed in a broken and irregular way for some considerable distance before again joining the main channel. The jam has now been cleared away and the channel is unobstructed and confined within its proper banks. A report in November from the inspector of the district called the attention of the department to a large log jam and about two miles above the junction of the Whitewater river and the Atnarko, and an engineer was sent to report on the situation.

*San Juan River, Vancouver Island.*—An inspection was made by an engineer of this river in July following reports of an obstruction. This was found to consist of a large log jam in a by-pass used by the fish at low flows of the river. Removal was not considered advisable as it was expected that in the course of time the river would again scour out the main channel to a dept that would permit fish to ascend during low flows. A small amount of work was done, however, by creating a passage under portions of the log jam to prevent fish from getting stranded in the passage.

*Marble Creek, Vancouver Island.*—The February freshet was responsible for a large disturbance in the condition of this river, and following a report received of a log jam considered to be a menace to the fisheries, an engineer inspected and reported on the obstruction. This was found to be a large jam in the bend of the river about three miles above the mouth. On the recommendation of the engineer, a channel 30 feet wide was cut along the left bank to ensure the free passage of fish this year. It is expected that future action of freshets may now disturb the balance of the jam and that no further expenditure will be necessary.

*Salmon River, Vancouver Island.*—A large log jam situated 18 miles upstream from the mouth of the river was reported by the inspector of the district in July, and in August a joint inspection by the supervisor of the district and an engineer was made. The jam extended about 1,000 feet in the length of



the stream and averaged 300 feet wide, the logs being piled up 15 feet high in places. The whole was considered an obstruction to the ascent of salmon, especially at medium flows. A recommendation was made to the department for a channel 80 feet wide to be opened up along the left bank, material taken out to be placed clear of the river. Owing to the size of this undertaking and the short time available before fall freshets it was considered that this could only be economically accomplished by using machinery, which was obtained locally. The cost of the work was reduced about 50 per cent by this arrangement. The river is now reported by the inspector of the district to be free of obstruction.

*Salmon River Tributary Streams, Vancouver Island.*—Obstructions were removed in four streams running into the lower reaches of Salmon river—Clark creek, Springer creek, Big creek or Elk river and Carney or Howe creek. All these are small streams frequented by cohoes and chums, and were badly choked with small debris and brush. It is estimated that six and one-half miles of spawning ground has now been opened up by the work undertaken.

*French Creek, Vancouver Island.*—An inspection was made of an obstruction in this stream situated a mile up from the mouth and consisting of a large collection of logs and debris, which were a complete barrier to the ascent of fish. The stream is a good spawning ground of coho and chum salmon, and work of clearing this obstruction was carried out.

*Takoosh River, Smiths Inlet.*—A log jam on this river was cut through in 1934. The estimated width of 30 feet was considered by the engineer necessary to keep the passage open, but owing to unforeseen difficulties the estimate did not allow for more than a 20 foot passage being made at that time. Accordingly, additional work was undertaken this year and the channel widened to 40 feet. This river has been known to support a heavy run of high grade chum salmon, and the importance of keeping it clear of obstructions was stressed by the inspector of the district as necessary in building the river up to its former strength.

*Alex Mountain Creek, Okanagan District.*—An obstruction of old logs and wood debris in this creek, which prevented the parent Kamloops trout from ascending to the only spawning beds available for the trout stock frequenting Island (Oyama) lake, was cleared out. The work was satisfactorily completed and the inspector reports that "fish could now pass upstream to these better spawning beds."

*Open Bay Creek, Quadra Island.*—Obstructions consisting of logging debris situated in the mouth of this creek, which were preventing the ascent of coho, were cleared out.

*Little Qualicum River, Vancouver Island.*—An inspection was made of an obstruction in this river which consisted partly of old logs and debris and partly of collapsed stringers of an abandoned logging railway bridge. The logging company responsible for leaving these stringers across the creek were instructed to remove them. Two men were supplied by the company, and with the help of the fishery guardian the whole of the obstruction was taken out and burnt.

*Gaabo Creek, Quatsino District, Vancouver Island.*—An inspection was made and report submitted on the falls on this river. The upper falls, which are about one mile from the mouth, consist of a perpendicular drop of 12 feet falling into a rock canyon with perpendicular walls and have been a natural termination to the ascent of salmon for hundreds of years. An estimate was

given on creating steps in these falls, and the matter of proceeding further with the undertaking is being held in abeyance until further data can be procured of the upper reaches.

*Capilano River, Vancouver.*—An inspection was made of a large log jam in this river following representations made to the department that it was obstructing the ascent of spawning fish. Examination revealed that there was ample depth of water under the jam, and that owing to the nature of the canyon bed and sides there was little likelihood of it becoming a compact barrier. No action was taken, and it is reported that this jam has been completely cleared out to sea by a November freshet.

*Koeye River, near Namu, No. 2 District.*—An inspection was made and report submitted on the falls of this river, situated six miles up from the mouth. These falls do not constitute a barrier to the ascent of salmon as there are two easy ascents over them, but there is a third channel on the north side which has a 25-foot perpendicular fall in it, and fish being attracted to these falls are held in a cul-de-sac. The problem resolved itself into either blocking all water descending this channel, building a fishway over the falls, or by erecting a barrier at the lower end to prevent the fish ascending. A rough estimate of the first two methods indicated very high cost, and in the case of the third method it was felt that only a low barrier could be constructed at any reasonable cost that would withstand the heavy volume descending this channel at times, and such a barrier would not stop all fish or make a material difference on the general fish production of this stream, in consequence of which the matter is not being proceeded with.

*Stamp Falls Fishway.*—Owing to heavy flood water during the winter of 1934-35 considerable loose rock was washed into the pools of the fish ladder, and the wall between pools Nos. 8 and 9 was damaged from a fall of ledge rock from the cliff above. The intake to the ladder was also choked with loose rock curtailing the requisite delivery of water, and the tool house containing stop logs and tools was washed away by the abnormally high water. Effective repairs were carried out this year and 5,953 sockeye and 22,465 coho on daylight counts passed through this fishway during the period the guardian was in attendance.

*Puntledge River Impounding Dam Fishway.*—The fishway in this dam, which is a wooden construction of Hocken type and attached on the lower side of an Amundsen concrete dam and using a flood gate opening, was damaged to such an extent by freshets in November, 1934, that it had to be replaced by a new fishway this year. The work was carried out by the Canadian Collieries Company, the owners of the dam.

*Screening of Outlet of Beaver Lake, near Kelowna.*—A consultation with the engineer for the Okanagan District Irrigation Company was held to discuss the feasibility of the screen proposed to be placed at the outlet of the lake above the dam owned by the company, and a satisfactory understanding was reached as to the requirements they considered necessary to ensure no curtailment in their water supply. The erection of the screen has not been proceeded with to date.

Minor obstructions to the ascent of fish caused by accumulations of logs, debris and windfalls were removed from the following streams:—

Village Bay creek, Quathiaski district  
Mission creek, Pender Harbour district  
Coal creek, Courtenay district  
Big Qualicum river, Vancouver island



Hunt creek, Vancouver island  
Lawson creek, Nanaimo district  
Salmon creek, Barclay Sound district.

At Brunell creek, Nanaimo district, trenching was done to liberate salmon fry which had become stranded due to low water.

#### FISH CULTURAL ESTABLISHMENTS

Work in connection with fish culture included the construction of a large hatchery in Nova Scotia in addition to smaller constructions, repairs and upkeep of existing plants. A classified report of the principal works performed is given hereunder.

##### NOVA SCOTIA

*Antigonish Hatchery.*—A circular rearing pond, 50 feet in diameter, was constructed with the necessary water supply and drain. Concrete bottoms were laid in 19 rectangular rearing ponds and repairs were made to the walls where frost had caused damage. A storage dam with gate control was built at the outlet of lake Katrine on the South river, from which the water supply for this hatchery is obtained, to afford a more uniform supply during periods of drought. The four circular ponds previously built at this hatchery were flooded during an abnormal freshet and to prevent loss of fish should this again occur sills were laid around the entire group with provision for setting a low wire netting.

*Bedford Hatchery.*—The bulkhead and screen at the head of the canal on the Sackville river, which is used as a salmon retaining pond, were entirely renewed and the upper end of the canal filled in, with a culvert through it to admit water, in order to prevent the entrance of debris. The dam on the Sackville river in connection with the hatchery, as well as the fishway, were repaired. An 8-inch wood stave pipe line was laid from the lower end of the canal to the concrete rearing ponds, supplementing the original supply which had not proved adequate when the pond system was extended. Minor repairs were made to the hatchery and dwelling.

*Margaree Hatchery.*—The fence around No. 1 brood pond was rebuilt. This is necessary to prevent the escape of fish in the event of severe freshets which at times inundate the flat on which the pond is built. Brood ponds Nos. 20, 22, 23 and 24 were improved by constructing wooden dams with intake and outlet screens, and the sides of the ponds were cribbed to prevent the escape of fish during high freshets. Sixteen new rearing troughs, each 12 feet long, 2 feet wide and 12 inches deep, were built and set up outside the hatchery with water supply and drain connections. A garage for the truck was fitted up in the old barn at the hatchery.

*Middleton Hatchery.*—A small leak which had developed in the concrete dam from which the hatchery water supply is taken, and the spillway, were repaired and the plank sluice from the spillway was renewed.

*Nictaux Rearing Station.*—A heavy freshet early in the year caused an ice jam which demolished 24 rearing troughs, together with the roofing over them. Eleven of the troughs were salvaged and repaired. In re-establishing this station a new site was selected and a building 60 feet long by 22 feet wide was erected to house 20 rearing troughs, each 16 feet long, 2 feet wide and 12 inches deep. Electric wiring was installed to facilitate operations.

*Yarmouth Hatchery.*—Two circular ponds, each approximately 25 feet in diameter, were built in the hatchery property with water supply and drains.



*Lindloff Hatchery.*—With the construction of rearing ponds at this hatchery last year, it became necessary to provide facilities for ice and a feed room, and it was decided to erect a building to include a garage and store room as well. This building, which measures 20 feet by 32 feet, was built during the year.

*Cobequid Hatchery.*—On the department's decision to proceed with the construction of a large hatchery establishment in Cumberland county, a site, preliminary surveys for which had previously been made, was selected on Second river, a tributary of River Phillip. Surveys of the properties required were completed and descriptions made for the preparation of deeds for the transfer to the department. Three lots are included, one of about 10 acres for the hatchery and rearing ponds, one comprising over three acres for the water supply and a third comprising one acre for the dwelling. Designs and specifications were prepared for the buildings and they were built by contract. They include the hatchery building, measuring 38 feet by 71 feet, 6 inches, the dwelling measuring 30 feet by 30 feet, and a third building which will be used for garage, storage and icehouse, measuring 18 feet by 50 feet. The hatchery building contains the hatching room, office, living-room and kitchen for the assistant, toilet, coal room, feed room and cold storage room, with storage space over the ells at each end of the building. The hatching room, measuring 38 feet by 42 feet, 6 inches, is fitted with 16 concrete rearing troughs, each 2 feet wide and 16 feet long, built into the floor, 30 hatching troughs, 10½ inches wide and 16 feet long, and six troughs 20 inches wide and 16 feet long. The hatching troughs are set up on trestles over the rearing troughs and water supply and drainage are provided. The cold storage room, measuring 6 feet by 7 feet, 10 inches, was introduced as a means of holding larger quantities of food for rearing purposes. It is fitted with galvanized iron retorts and will be operated with ice and salt for refrigeration. The walls are insulated with corkboard, the inner surfaces being cement plastered.

The dwelling is a bungalow type containing living-room, dining-room, kitchen, bathroom and four bedrooms with full basement. A hot air furnace is installed for heating.

All buildings are wired for electric lights and a generator operated by a gasoline engine with the necessary storage batteries will be installed during the coming year.

Suitable septic tanks are provided for both the hatchery and dwelling.

The water supply for the hatchery and projected rearing ponds is taken from Second river. A reinforced concrete dam, 62 feet long and approximately 8 feet high, was built at a suitable location, from which an 18-inch wood stave pipe line was laid in excavation for a length of 750 feet where a 10-inch branch pipe was run to the hatchery and provision made for taking off a 14-inch branch to the rearing pond system.

*Grafton Brook Rearing Ponds.*—During the year the department decided to proceed with a system of rearing ponds at Grafton brook in northern Queens county. Preliminary surveys had been made previously but it was necessary to conduct complete surveys of the site to determine property lines, right of way from the public road, and for the layout of the pond system and dam for a water supply. It developed during these surveys that in order to hold sufficient storage in Grafton lake to afford an adequate water supply for the pond system, it would be necessary to hold the lake level somewhat beyond high water level, and this involved a survey around the lake to obtain the acreage of flowage that it would be necessary to secure from each property owner. Considerable work was done on the construction of the dam and the site for the ponds was cleared when, due to the late season, it was considered advisable to close down until the coming year.

## NEW BRUNSWICK

*Saint John Hatchery.*—The concrete well into which the water supply for the large rearing pond system flows and from which it is distributed to the ponds was renewed. The course of Little River, where it flows directly past the hatchery property, was changed by excavating a new channel. This became necessary as, due to erosion of the banks, the river was causing flooding of some of the rearing ponds during high freshets. A service pipe for domestic water supply to the hatchery dwelling was installed from the city of Saint John main, which is only some 200 feet distant where it passes the hatchery property.

*Florenceville Hatchery.*—Four new hatching troughs were built and the electric pump for domestic water supply was renewed.

*Restigouche Hatchery.*—Part of the sill on the north side of the hatchery was renewed and this work included replacement of some joists and flooring. Part of the hatchery supply trough was renewed and 10 new hatching troughs were made and installed.

## PRINCE EDWARD ISLAND

*Kelly's Pond Hatchery.*—The residence at this hatchery is small and contained only two bedrooms. In order to provide some added accommodation the roof over the kitchen ell was raised and a third bedroom fitted up in the space thus made available. Two new supply troughs were installed in the hatchery to replace old ones which had decayed beyond repair.

## BRITISH COLUMBIA

Repairs to hatcheries for sockeye salmon were kept to a minimum throughout the year awaiting a final decision regarding the future policy in this branch of fish culture. Should the continuance of these establishments be decided upon, certain repairs which have been held in abeyance will need to be executed during the coming year.

*Cowichan Lake Hatchery.*—On the transfer of this establishment to the Biological Board for operation in connection with the biological survey of the Cowichan Lake watershed, it was found that certain repairs and additions to existing buildings were required, and certain improvements in connection with the rearing pond system were desirable. The following works were carried out:—

The dwelling house used by the officer in charge was completely renovated. All worn out floors were renewed, walls and ceiling of sitting-room refaced with plaster board, fireplace and mantel rebuilt, pantry and bedrooms provided with new cupboards and shelves, bathroom fixtures repaired and worn parts replaced, foundations jacked up and outside stairway renewed.

The mess house was converted into quarters for a married assistant by the addition of a new sitting-room and bathroom complete with bath, toilet and wash bowl. Inside walls were painted and floors renewed and repaired where required.

The retaining ponds were emptied, thoroughly disinfected and relaquered. The salting troughs in the bottom of the ponds were planked over, and new drainage facilities provided whereby the ponds can be quickly flushed out when required. The new drainage scheme entailed the construction of a drainage tank measuring 3 feet x 4 feet x 50 feet alongside the discharge end of the ponds into which the contents of the pond, when quickly released, would empty, to pass later into the drainage ditches in normal quantity and with normal velocity.

*Penask Lake Hatchery.*—Extreme floods in the early spring of 1935 were responsible for washouts in the spawning and retaining fences, on Penask creek,



and it was necessary that these fences be reconstructed in order that they might be ready for the spring collection of 1936. The spawning fence was entirely rebuilt with new material about one foot lower in elevation than the old fence. The length of the new fence was increased to 50 feet and both banks of the creek were cribbed with squared timbers cut locally and faced with 2 inch x 6 inch T and G sheet piling running well into the bank, and trenched into the adjoining ground. The retaining fence was increased to a length of 30 feet, discarded material from the spawning fence being used up in this extension. The creek in the immediate vicinity was cleared of all floating trash and overhanging trees in order to assist in the rapid discharge of water at flood time. The roofs of the dwelling and hatchery were each given brush coats of roofing compound and the walls of the hatchery building were jacked up and blocked to prevent subsidence.

*Skeena River Hatchery.*—Freshets of extraordinary violence in the vicinity of Lakelse lake were responsible for the closing down of the Skeena hatchery in the month of December. During the freshet the 8 inch water main which supplies the hatchery became blocked and the flow of water ceased completely. The pipe line is buried in a trench and is covered in places with as much as 7 feet of earth and boulders, and the local staff was unable to locate and remove the trouble in sufficient time to enable the contents of the hatchery still to be carried in the troughs. It was therefore decided that the eggs should be distributed in the gravel beds on the shores of Lakelse lake as eyed eggs to reach maturity in the natural way, and the establishment was, for the time being, closed down.

#### CO-OPERATIVE FISH CULTURE AND SURVEYS FOR HATCHERY ESTABLISHMENTS

In Nova Scotia, at the request of the Kings County Fish and Game Protective Association, instrumental surveys were made of sites for proposed rearing ponds at Sutton's pond, Bishop's brook and Cold brook, Kings county.

Instrumental surveys were made of proposed sites for rearing ponds at Nietaux falls and Parkers brook in Annapolis county.

Surveys were made to determine the areas of Tedford and Boar's Back lakes in Yarmouth county where the department was considering the elimination of coarse fish.

#### LEASING OF OYSTER AREAS

During the year under review the leasing of unproductive oyster bottom at suitable places in Prince Edward Island was continued. Twenty leases were issued, making a total with those issued in previous years since leasing started in 1932, of 99, and covering 423.78 acres. There were, in addition to the completed leases, 215 applications before the department. Of the completed leases, 74 are in Malpeque bay, 4 in Foxley river, 3 in Conway inlet, 8 in Brackley bay, 2 in Covehead bay, 3 in Pinette river, 1 in Rustico bay and 4 in Savage harbour.

Applicants had difficulty during the year in securing the services of surveyors to locate their areas, and there is little doubt that this was responsible in a measure for the small number of completed leases.

A detailed report of oyster cultural work by the department will be found in Appendix No. 186.

#### MISCELLANEOUS

*Fisheries Warehouse and Repair Shops, New Westminster.*—As a consequence of the partial failure of the traffic bridge connecting Poplar island with the mainland it became necessary, after consultation with the Public Works Department, to seek a new site for the repair shops and warehouse on Poplar island, and a suitable site was secured at the abandoned plant of the Shell Oil



Company on the North Arm, Fraser river. Plans and specifications were prepared for the necessary buildings, wharf and floats, but before definite action could be taken by the department the site passed into other hands and was no longer available. Land immediately adjacent to this site was, however, found to be available and a lease for a period of years was approved. Plans have now been prepared in the resident engineer's office at Vancouver for an entirely new layout on this site—a large building to contain warehouse, machine shop, carpenter shop and net loft, a caretaker's residence, and a series of floats for the mooring of patrol boats. The site is within the limits of the city of New Westminster and is accessible both from land and water and favourably situated as regards fire protection and water service.

*Fisheries Station, Schooner Passage, Rivers Inlet, B.C.*—Repairs to the wharf and gangway at this station, and replacement of the water pipe line were undertaken during the year by the Public Works Department and arrangements have been completed for the addition of a fully equipped bathroom to the residence.

*Capture of Coarse Fish.*—Fences and traps for the capture of coarse fish, including carp, squawfish and suckers, were constructed at small cost in two creeks in the Okanagan district, one draining into Duck lake and one into Woods lake. A similar fence and trap were also constructed in the outlet of lac La Hache in the Cariboo district. The Okanagan traps were responsible for the capture of 12 tons of coarse fish, which were destroyed and carried away by local residents. Operation of the trap at lac La Hache was interrupted when it was carried away by freshets before the period of migration was over. During its period of operation, however, over 3,000 coarse fish of various species were captured and destroyed. Several additional sites for the capture of coarse fish have been examined with a view to the expansion of this work, if such expansion is considered advisable.

*Boundary Signs, Fraser River, Area 17.*—The destruction during winter storms of the fishing boundary sign on the Sandheads at the mouth of the Fraser river rendered its reconstruction necessary, and opportunity was taken at the same time to install an additional ranging sign to assist fishermen and patrolmen to determine the boundary line more clearly. These signs each consist of three long piles driven into the ground and surmounted by a triangular painted sign well above high water mark. The work was awarded by tender to a local firm and was conducted under the supervision of the Engineering Branch, which also prepared plans and specifications.

*General Office Work.*—In addition to the designs for all structures and works of various kinds coming within the duties of the Engineering branch, maps and charts dealing with fisheries situations were prepared and in British Columbia complete new tracings of Fisheries Districts Nos. 2 and 3, covering the coastal waters of the province, were completed and are available as copies are needed.

## APPENDIX No. 6

### REPORT ON OYSTER CULTURAL WORK BY THE DEPARTMENT OF FISHERIES, 1935-36

BY A. W. H. NEEDLER, Ph.D., BIOLOGICAL BOARD OF CANADA

By an agreement with the Province of Prince Edward Island in 1928, the Dominion Government obtained jurisdiction over the oyster areas of the province and undertook to develop its oyster industry. As the most important step in that direction, the establishment of oyster farming was planned in those suitable areas which did not support a valuable public fishery. The most important of these was the Malpeque Bay area which once supported the largest fishery in the province but in which the oyster stocks had been reduced to a low level by intensive fishing and then almost completely obliterated by a disease in the years following 1914. Operations were concentrated in this area which has similar conditions to those in other areas along the north shore of the province.

The presence of oysters in small but increasing quantities at the heads of the inlets tributary to Malpeque bay had indicated that oyster farming might again be feasible in the area. In 1928 and 1929 the area was explored by the department and experimental plots were established on which the success of certain oyster cultural methods was to be demonstrated or determined. The department obtained the services of a practical oyster farmer from New England who applied methods known to him, using as a basis both locally produced "seed" oysters and oysters transferred from other areas in the province. In 1929 the Biological Board of Canada commenced scientific investigations relative to oyster culture, making its headquarters on Bideford river, one of the inlets tributary to Malpeque bay. In 1930 the experimental work of the department was placed under the supervision of the writer who was in charge of the board's oyster investigations.

It was found that oysters introduced from other areas died in about a year with symptoms similar to those of the disease of 1914-16, while local oysters were unaffected, being apparently resistant. To prevent further damage by the disease, the transfer of oysters to and from the affected area was prohibited, and it was necessary to depend on the local stock to establish oyster culture. The stock was limited largely to the heads of the inlets or "rivers" and to a narrow shore zone, i.e. to places where the greater summer warming of the water favoured reproduction and where wave wash kept the bottom clean. Deeper grounds were practically barren and, in the rivers, badly silted. The dependence of the industry on the very limited local stock emphasized the importance of conserving it for use in establishing oyster farming and of developing the best possible cultural methods. The area was kept closed to public fishing and the experimental farming, now concentrated in Bideford river, was continued.

In 1931, when the results of experimental farming were considered sufficiently promising to warrant encouraging private oyster farming, oyster ground in the Malpeque Bay area and in certain other bays having similar conditions was offered for lease. A survey to facilitate the definition of the leases had been made in 1929 and 1930. Areas at the heads of the inlets, where reproduction is good but the quality of the oysters poor, were reserved for spat collection by all, and the department reserved areas in Bideford river for the continuance of experimental farming. These areas were also used for the production of stock to be sold to lessees to establish oyster culture in their leased areas.



In leasing oyster ground when there are conflicting applications for the same area at about the same time preference is given first to the shore-front owner, second to the owner of shore fronting on a neighbouring departmental reserve, third to a resident of the district, fourth to a resident of the province, and last to a person or company outside the province. The limit of the area leased to a single applicant has been  $5\frac{1}{2}$  acres. These policies were adopted to insure that the local or small applicant would not be kept out of the industry by large concessions.

In the case of each application a report on the local conditions is made by a biologist so that the applicant will have as much information as possible on the prospects and the methods of oyster farming most likely to be successful in advance of the completion of the lease.

*Development of Leased Areas.*—A number of applications were received immediately after the offer of oyster ground for leases in October, 1931, and there has been a steady growth of the leasing and of the development of the leased areas since that time.

Table 1, appended, summarizes the development of leased areas, including a number of areas on which work has been carried on at the applicant's risk in advance of completion of the leases.

The figures show clearly the increase in the number of areas under cultivation, in the total acreage, in the development work and in the yield. The spread of oyster culture to new districts has continued. Development work is reported this year for the first time in Brudenell river, in Pinette river and in Conway inlet and Boyles river (two small inlets between Malpeque and Cascumpeque bays). Applications have also been approved for leases in Fortune river and in Tryon river.

The table fails to give an adequate account of the development work being carried on, much of which is not readily reducible to figures. The following, for example, are not included: cleaning of ground, removal of mussels or starfish, separation of clusters, spat collection through cleaning at the proper time, transfers of oysters within leases from producing and growing grounds to maturing grounds, rearing of separate spat on trays, etc. In these ways sound and effective oyster culture is being carried on which is not mentioned in the table. To give some indication of the total amount of work done an effort has been made to obtain figures for the time and money spent by lessees or applicants in 1935. In this first attempt the results were inevitably incomplete and the true figures are in excess of the totals obtained. These amounted to over 1,500 days' work by the lessees themselves, over \$2,700 paid in wages and over \$2,800 for materials, equipment or oysters. There were, in addition, a great many incidental expenses not included, such as travelling, trucking, surveys, etc., and rentals paid amounting to over \$400. The actual reported 1935 investment amounts to over \$8,500 (allowing \$1.75 per day for lessees' time) and there is little doubt that the true figure would be well over \$9,000. Taking into consideration the high proportion of lessees who are just starting, and are working as yet on an experimental scale, the time and money spent is very encouraging.

The yield has commenced a rapid increase. Adding to the totals given in the table the yield from the deeded area of G. S. Sharp et al., we obtain total yields from private culture of 231 barrels in 1933, 525½ barrels in 1934 and 1,123½ barrels in 1935—a yield more than doubling each year. In spite of this there has been no tendency on the part of the lessees to deplete their areas. The quantities planted remain approximately double the quantities taken and they do not include development through spat collection. It is anticipated that the yield will again increase greatly in 1936 (possibly double again). As is to be expected, the value of the yield is still below the amount spent in 1935



and this will continue as long as the great rapidity of expansion of which it is a symptom.

The oyster farming industry is now established and growing rapidly. The actual expansion has been retarded by a number of factors (delays in surveying, scarcity of funds, etc.) and does not do justice to the increasing interest being taken both on the part of lessees and of prospective applicants. The industry has reached the stage where the first or most enterprising lessees are demonstrating that private oyster culture is profitable and increased interest and effort are resulting. It is at a stage where every effort must be made to facilitate the expansion so that the interest will not be discouraged. There must be an effort to meet the growing demand for stock for planting. The development of improvements in oyster cultural methods must be continued and the knowledge of the oysters and the conditions affecting their growth and reproduction must be made to keep pace with and in advance of a growing and changing industry. These are the aims of the department's experimental farming and related investigations and operations.

The year under review has seen the formation of the Prince Edward Island Oyster Growers' Association, an organization of those engaged in oyster farming which, it is expected, will assist materially in the proper development and regulation of the industry.

*Investigations, Experimental Farming and Provision of Stock.*—The need for continued investigations and for the provision of stock for planting purposes has just been stressed.

Experimental farming in close co-operation with the investigations by the Biological Board has been carried on in Bideford river (tributary to Malpeque bay) where areas have been set aside for that purpose and where the board has established the Prince Edward Island Biological Station at Ellerslie. The scientific investigations by the board have been designed to develop cultural methods and to provide a sound basis of knowledge for the administration and development of the industry. The department has carried out larger scale trials of methods based on and followed by the scientific investigations, and it has made an effort to provide "seed" stock to oyster farmers.

While headquarters for the work as a whole are maintained at Ellerslie, the special needs of other localities are being borne in mind. Investigations, demonstrations or operations for the provision of stock are being carried out or are planned elsewhere to meet these special needs as they arise.

*Sale of Marketable Oysters from the Experimental Farm.*—In 1935 331.7 barrels were marketed from the experimental farm in Bideford river; 232.3 barrels were of ordinary quality (\$4 per barrel), 53.4 of medium quality (\$5 per barrel) and 46 select (\$9 per barrel). The quantities of all grades were below those in 1934, owing partly to the relatively poor success of spat collection in 1930 and 1931 and partly to the large quantities of small oysters sold to lessees for planting. Present stocks of small oysters are sufficient for an increased production of all grades.

*Provision of Planting Stock in the Malpeque and Cascumpeque Areas.*—In 1935, 268 barrels of oysters were sold to lessees for stocking purposes from the department's areas in Bideford river. The price was increased to \$2.50 per barrel as compared with \$2 in 1934. In spite of this there was an increased demand and an increase over the 1934 sales (233 barrels). The problem of the growing demand has already been indicated and larger quantities could have been sold if they had been available.

There has been an alternative source of planting stock in the department's policy of issuing permits to lessees to pick oysters for that purpose in the shallow shore zone where winter mortality is high. The policy has led to the

transfer of large quantities of oysters from the shallow water into deeper water, thereby saving them from the winter killing which would otherwise have destroyed a large proportion. In 1934 about 975 barrels were picked in this way in the Malpeque area. In 1935, although the demand was greater, only about 850 barrels were obtained. The supply for picking depends on the natural settling of spat from year to year and is, accordingly, subject to great variation. It cannot be expected to increase in proportion with the increase in oyster culture and with the demand. It is, moreover, encroached upon by the leasing of shallow areas which can be used to better advantage for spat collection or for summer rearing of oysters obtained on cardboard collectors or from other sources.

It is obvious, then, that as the industry grows the demand for the purchase of oysters for planting will increase greatly. It is planned to meet this demand by continuing the sales from the experimental farm in Bideford river and by extending the taking of small oysters for sale to reserved areas at the heads of other inlets. While an increased allotment of funds would be necessary for this purpose it would be met by an increase in revenue and the actual cost to the government would not be increased.

*Provision of Planting Stock to Lessees from Hillsborough River.*—To meet a demand on the part of lessees of oyster areas east of Malpeque bay, the department dredged small oysters in Hillsborough river for sale for planting purposes. The work, which was to some extent experimental, was carried out with a motor boat and a small hand dredge. The oysters were taken in deep water on areas near the head of Hillsborough river where small sizes predominate. The material dredged, shells and oysters, was sold unsorted at \$1 per barrel which was intended to cover the cost but which was found to be slightly too low. A repetition next year is contemplated, if demand warrants and with some adjustments in price and method.

In 1935 a total of 454 barrels of the mixed oysters and shells were sold to lessees in Rustico, Covehead, Tracadie and Savage bays.

*Rearing Separate Spat on Trays and Sale of Spat.*—In the past two or three years a method of obtaining spat on cardboard collectors, separating them and rearing them on trays during their second summer has been developed. The method is described in some detail in Bulletin 48 of the Biological Board issued early in 1935. It offers many advantages—especially avoidance of losses from starfish damage and the production of single oysters of good shape—and it has already been adopted by a number of lessees. In 1935 over 400,000 single oysters were reared by oyster farmers in the Malpeque and Cascumpeque areas using this method. It is specially well adapted for the production of high quality oysters and is based on an increase of natural production through an efficient method of spat collection.

To encourage the adoption of the method the department has offered the concrete-coated egg-crate fillers bearing each 1,000 or more separable spat at 15 cents apiece, an approximate cost charge. During the past year 257 of the 1934 crop were sold in the spring and 554 of the 1935 crop were sold in the autumn. A great many have been requested for delivery in the spring of 1936 as the holding of the spat over the winter of 1934-35 was successful. Lessees themselves used over 2,500 cardboard collectors in 1935 and it is expected that the private production of spat for sale will soon be developed. If the present price of 15 cents per collector is maintained such a business could be made to yield returns as the cost of materials is less than 5 cents per collector and 10 cents would remain for wages.

It is planned to extend the trial and demonstration of this method to some central locality among the north shore bays east of Malpeque bay to make it more easily available to the lessees there.



In 1935 some minor improvements in the method were developed and investigations are being continued along lines promising to reduce the cost considerably. Although the method is economically valuable as it stands, many are kept from using it by the cost of the trays. Preliminary trials have indicated that creosoted lumber will be a satisfactory substitute for the more expensive planed and copper-painted lumber now used and they are being carried further. Cheaper substitutes for the expensive galvanized wire cloth will be tried in 1936. Whereas it is known that the direct planting of the small spat is unsatisfactory and that after rearing for a whole year the results are good, the planting of intermediate sizes during the summer has not been sufficiently explored and experiments along these lines are planned. They might lead to a considerable reduction of cost.

*Other Rearing Experiments.*—In the Malpeque Bay area, where spat collection has been fairly consistently successful for the past seven years, the rearing of the spat to a size at which they are reasonably safe from starfish and not very susceptible to smothering remains the principal problem. Other possibilities in addition to the rearing of separate spat on trays are being explored. Two of these might be mentioned briefly. Hardened bottoms in sheltered shallow situations were tried in 1935, for rearing separate spat. Gravelled bottoms or wooden floors sunk with gravel gave poor results, owing largely to a strong growth of the finer seaweeds and consequent silting and smothering. Damage by starfish was avoided by using the head of a creek where the water became too warm for them in summer, but the smothering led to poor survival, growth and shape. It is planned to continue experiments in this connection.

In another series of trials spat on shells were reared in their second summer on shore near low-tide level. The practice had already been developed of holding spat on shells in wire bags piled on the bottom at the head of the inlet until the spring when the bags were lifted and the spat spread on firm bottom farther down the inlet. In this way damage by starfish is less than when spat are planted down the inlet in the autumn and satisfactory results can be obtained on certain grounds. But a good "set" on shells always leads to clustering and poor shape if the survival is good and the clusters must be raised and separated when the oysters are from one to two years old. It was hoped that by spreading the shells on firm shores in the spring the spat would be relatively safe from starfish during the summer and would be large enough in the autumn to be raked up, separated and planted out on any firm ground with fair safety. In this way the labour of lifting the spat for separation would be reduced and use would be made of shore areas to supplement the limited areas of suitable "rearing grounds." Results were sufficiently promising on some types of shore to warrant continuation of the experiments, although the growth of fine seaweeds and the consequent silting caused trouble.

*Starfish.*—The Biological Board continued in 1935 study of the starfish, having in view the development of methods of avoiding or of controlling them. The investigations have already led to a better understanding of the limits of starfish occurrence and of their movements (especially absence from warm water in summer) which has already been of value in development of procedures for rearing oysters in their first two years.

*Bras d'Or Lakes.*—Following a preliminary survey of conditions in the Bras d'Or lakes, Cape Breton, in 1934, the effect of transferring the dark-mantled oysters of the "lakes" to saltier waters was determined. It was found that three months even in the salty waters at St. Andrews (over 3 per cent salt) and at Port Hood island did not produce any perceptible lessening of the



dark mantle edge, although it did, as was expected, result in improvement in flavour. No other practical method of overcoming the darkness of the mantle is in view.

The investigations in 1935 were regarded only as supplementing the preliminary survey along certain lines which were possible with limited expenditure of time or money. No great progress in the development of the industry in the Bras d'Or Lakes is believed possible without more extensive work, including the testing of various methods of oyster culture and their modification to local conditions.

*Shediac Bay.*—No further investigations were carried out in 1935 in the Shediac area, New Brunswick, pending completion by the Department of Pensions and National Health of the examination of conditions in the bay. The preliminary examinations have not sufficed for final decision regarding the safety of direct marketing of oysters from the bay or its various parts.

The work by the Biological Board and the Department of Fisheries in this area in 1932 and 1933 has been outlined in previous reports. It has served to bring some of the special problems of the area to light, especially the erratic local production of spat, and to provide a basis for attack on them in the future.

TABLE I.—SUMMARIZING THE DEVELOPMENT OF AREAS UNDER CULTIVATION IN 1935

Region	Year	Number of areas under cultivation	Approximate total area (acres)	Oysters planted (bbls.)	Oysters sold (bbls.)	Shells used for spat collection (bush.)	Cardboard spat collectors (No.)
Malpeque*.....	1932	26	110	254	.....	1,500	.....
	1933	45	195	593	42	1,600	.....
	1934	81	367	1,093	335½	1,000	1,190
	1935	94	430	959	771½	575	3,400
Cascumpeque..... (Foxley R.)	1933	2	8	17	.....	.....	.....
	1934	4	20½	423	33	50	64
	1935	5	21½	178	85	.....	.....
Covehead-Brackley.	1933	6	33	370†	50	300	.....
	1934	8	44	343†	92	2,500	.....
	1935	13	61	248†	140	800	.....
Savage.....	1933	3	8	58	.....	100	.....
	1934	3	8	102	.....	150	.....
	1935	5	19	147	.....	3,500	.....
Rustico.....	1934	1	5½	100	.....	.....	.....
	1935	3	16½	145	5	15	.....
Tracadie.....	1934	1	5½	50	.....	.....	.....
	1935	5	20	200	.....	.....	.....
Conway Inlet.....	1935	3	16½	76	.....	70	.....
Boyles River.....	1935	1	1	14	.....	.....	.....
Pinette River.....	1935	10	15	126	.....	.....	.....
Brudenell River...	1935	1	1	10	.....	.....	.....
Total.....	1932	26	110	254	.....	1,500	.....
	1933	56	244	1,038	92	2,000	.....
	1934	98	451	2,111	460½	3,700	1,250
	1935	140	601½	2,103	1,001½	5,000	3,400

\*Not including the deeded area of G. S. Sharp et al. from which 122 bbls. were sold in 1935 and on which 73 bbls. were planted.

†Not including oysters planted for part of the season only and taken up again for market, 350 bbls. in 1935.

The table is not wholly complete. Through unavoidable omission of some items the figures will in some instances be lower than the truth. The areas given are approximate total acreages of holdings, any part of which are under cultivation; it is impossible to estimate the actual area in use.

## APPENDIX No. 7

### SUMMARY OF EXPENDITURE AND REVENUE, BY PROVINCES, IN THE FISHERIES SERVICE 1867—1935-36

### UNDER THE DOMINION GOVERNMENT AND FINANCIAL STATEMENT OF THE DEPARTMENT OF FISHERIES FOR 1935-36

	Expenditure	Revenue
	\$ cts.	\$ cts.
Nova Scotia.....	6,740,192 27	421,933 34
Prince Edward Island.....	1,077,691 75	126,186 54
New Brunswick.....	4,836,532 85	641,747 54
Quebec.....	2,448,829 91	342,256 62
Ontario.....	3,220,805 27	520,237 81
Manitoba and Northwest Territories.....	23,414 29	4,779 25
Manitoba.....	1,763,968 84	334,589 81
Northwest Territories.....	58,258 58	9,775 23
Alberta.....	518,261 96	226,736 41
Saskatchewan.....	575,983 42	101,945 16
British Columbia.....	15,333,049 06	2,821,786 19
Yukon.....	29,343 94	14,227 75
Hudson Bay District.....		821 83
	36,626,332 14	5,567,023 48
Cruisers, N.S., P.E.I., N.B.....	5,934,430 56	
Expenditure, General.....	5,406,953 41	
Fishing Bounty.....	8,548,305 06	
	56,516,021 17	

### FINANCIAL STATEMENT, 1935-36

Vote No.	Appropriation	Amount	Expenditure
		\$ cts.	\$ cts.
159	Salaries and disbursements, fishery officers.....	985,328 00	478,041 01
	Fisheries Patrol Service.....		230,913 71
	Fisheries Protection Service.....		204,747 28
			913,702 00
160	Building fishways and clearing rivers.....	6,000 00	4,721 47
161	Legal and incidental expenses.....	6,000 00	3,061 86
162	Conservation and development of Deep Sea Fisheries, etc.....	85,000 00	39,128 15
163	Fish culture.....	240,000 00	231,036 57
164	Oyster culture.....	10,000 00	9,903 01
165	International Fisheries Commission (Halibut).....	25,000 00	24,964 92
*166	Marine Biological Board of Canada.....	192,404 65	192,404 65
167	Grant to United Maritime fishermen.....	4,050 00	4,050 00
		1,553,782 65	1,422,972 63
*8	Civil Government salaries.....	102,449 31	102,449 31
8	Civil Government contingencies.....	27,900 00	18,775 81
Statutory	Fishing bounty.....	160,000 00	159,966 20
Statutory	Minister's salary.....	9,500 00	6,001 29
Statutory	Gratuities.....	180 00	180 00
		1,853,811 96	1,710,345 24
	ASSET—"Special Account U.S. Government re Halibut Treaty" (Balance due Canada on divisible expenditure at close of fiscal year 1935-36.)		6,799 43
			1,717,144 67

\*Includes amounts from S.D.A. Shortages 1935-36—Statutory and Votes 266 and 406 Reclassification, etc.

## STATEMENT OF REVENUE RECEIVED DURING THE FISCAL YEAR 1935-36

Class	Total	General Account	Nova Scotia	Prince Edward Island	New Brunswick	Quebec	Ontario	British Columbia	Yukon
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Fisheries revenue.....	42,104 25	.....	10,480 50	1,677 00	8,866 50	305 50	1 00	20,168 75	605 00
Fines and forfeitures.....	6,784 82	.....	641 02	285 45	925 54	55 00	.....	4,867 81	.....
Casual revenue.....	4,681 69	208 45	445 82	3,728 95	22 35	25 00	.....	251 12	.....
Fish culture revenue.....	424 00	.....	.....	.....	305 00	.....	.....	119 00	.....
Modus vivendi.....	301 00	.....	69 00	.....	.....	.....	.....	232 00	.....
Pelagic sealing revenue.....	113,594 61	113,594 61	.....	.....	.....	.....	.....	.....	.....
Premium, discount and exchange.....	2 23	1 93	.....	0 15	.....	.....	.....	0 15	.....
Refund of fines received prior to 1935-36 (B.C.)..	167,892 60	113,804 99	11,636 34	5,701 55	10,119 39	385 50	1 00	25,638 83	605 00
	30 00	.....	.....	.....	.....	.....	.....	.....	.....
	167,862 60	.....	.....	.....	.....	.....	.....	.....	.....

## EXPENDITURE 1935-36—SUMMARY OF SALARIES AND DISBURSEMENTS OF FISHERY OFFICERS

	Totals	Advertising and Publicity	Communication Services	Equipment	Grants, Subs., Contrs.	Miscellaneous Current Expenses	Personal Services	Professional and Special Services	Rents	Materials and Supplies	Transportation of Things	Transportation of Persons
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Nova Scotia..	176,111 07	1 50	6,102 01	.....	1 00	783 37	132,259 74	134 25	12 00	4,640 56	564 08	31,612 56
Prince Edward Island..	23,190 98	.....	744 95	.....	.....	158 08	14,810 54	86 05	.....	2,234 51	101 71	5,055 14
Quebec (M.I.)..	6,120 39	.....	110 31	.....	4 00	231 50	4,156 50	.....	.....	20 83	1 30	1,595 95
New Brunswick	120,894 64	.....	2,850 38	6 09	.....	459 95	89,873 75	448 42	10 00	3,297 01	252 30	23,696 74
British Columbia	151,723 93	.....	6,695 74	2,039 67	.....	1,396 75	101,938 57	1,027 75	522 94	8,374 41	945 98	28,782 12
	478,041 01	1 50	16,503 39	2,045 76	5 00	3,029 65	343,039 10	1,696 47	544 94	18,567 32	1,865 37	90,742 51



## DEPARTMENT OF FISHERIES

## FISHERIES PATROL SERVICE—EXPENDITURE 1935-36 AND SUMMARY

<i>Nova Scotia—</i>		
<i>District No. 2—</i>		
Departmental boats.....	\$ 11,545 68	
Chartered boats.....	3,799 98	
<i>District No. 3—</i>		
Departmental boats.....	13,855 26	
	<u>\$</u>	29,200 92
<i>Prince Edward Island—</i>		
Departmental boats.....	2,062 48	
Chartered boats.....	6,722 89	
	<u></u>	8,785 37
<i>New Brunswick—</i>		
<i>District No. 1—</i>		
Departmental boats.....	11,702 30	
<i>District No. 2—</i>		
Departmental boats.....	1,741 17	
Chartered boats.....	17,434 98	
	<u></u>	30,878 45
<i>British Columbia—</i>		
General account.....	3,415 21	
Digby Island.....	5,235 59	
Poplar Island.....	2,051 33	
Air Patrol.....	19,683 86	
<i>District No. 1—</i>		
Departmental boats.....	17,342 72	
Chartered boats.....	953 36	
General.....	177 50	
<i>District No. 2—</i>		
Departmental boats.....	31,619 30	
Chartered boats.....	29,873 38	
General.....	444 43	
<i>District No. 3—</i>		
Departmental boats.....	19,017 50	
Chartered boats.....	31,993 71	
General.....	241 08	
	<u></u>	162,048 97
		<u>230,913 71</u>

## SUMMARY

Nova Scotia.....	\$ 29,200 92
Prince Edward Island.....	8,785 37
New Brunswick.....	30,878 45
British Columbia.....	162,048 97
	<u>\$ 230,913 71</u>

## FISHERIES PROTECTION SERVICE—SUMMARY FOR 1935-36

East coast.....	\$ 87,829 45
West coast.....	116,917 83
	<u>\$ 204,747 28</u>

## DETAILED STATEMENT OF FISH CULTURE, 1935-36

Hatcheries	Personal Services	Other Outlay	Total by Hatcheries	Total by Provinces
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
<i>Nova Scotia—</i>				
Antigonish.....	7,834 74	8,029 52	15,864 26	
Bedford.....	4,140 65	2,969 32	7,109 97	
Cobequid.....	3,621 23	17,033 81	20,655 04	
Lindloff.....	1,898 56	1,478 84	3,377 40	
Margaree.....	5,623 86	3,495 01	9,118 87	
Margaree Pond.....	2,144 64	2,044 47	4,189 11	
Middleton.....	3,990 75	1,602 27	5,593 02	
Nictaux Pond.....	739 20	909 83	1,649 03	
Phillip River Pond.....	695 25	356 64	1,051 89	
Sackville River Pond.....	243 00	38 71	281 71	
Yarmouth.....	5,130 30	4,450 43	9,580 73	
				78,471 03
<i>Prince Edward Island—</i>				
Kelly's Pond Hatchery.....	3,453 45	1,324 01	4,777 46	
Morrell River Pond.....	492 60	31 87	524 47	
				5,301 93
<i>New Brunswick—</i>				
Bartiboque.....	675 00	884 40	1,559 40	
Florenceville.....	4,914 70	2,583 93	7,498 63	
Grand Falls.....	3,276 50	3,229 14	6,505 64	
Miramichi.....	4,825 35	2,229 78	7,055 13	
Miramichi Pond.....	961 20	686 62	1,647 82	
New Mills Pond.....	1,923 40	1,325 91	3,249 31	
Nipisiquit.....	415 90	65 93	481 83	
Restigouche.....	3,108 51	1,125 01	4,233 52	
Saint John.....	6,562 75	3,562 25	10,125 00	
Saint John Pond.....	1,662 88	3,347 24	5,010 12	
				47,366 40
<i>Supervisor, Engineer and Staff—East.....</i>	<i>5,058 00</i>	<i>1,781 35</i>	<i>6,839 35</i>	<i>6,839 35</i>
<i>General Account—East—</i>				
Mersey River Rearing Pond, N.S.....	27 50	123 23	150 73	
Mersey River Spawning, Redd, N.S.....	412 30	105 10	517 40	
Mill Brook Trout Ponds, N.S.....	1,353 50	920 27	2,273 77	
Wittenburg Rearing Pond, N.S.....		25 00	25 00	
General.....	14 00	2,014 33	2,028 33	
				4,995 23
<i>British Columbia—</i>				
Anderson.....	4,247 41	644 96	4,892 37	
Babine.....	4,771 06	1,585 97	6,357 03	
Cowichan.....	5,744 15	2,413 58	8,157 73	
Cultus.....	3,972 89	2,005 04	5,977 93	
Kennedy.....	5,069 09	855 33	5,924 42	
Lakelse.....	4,753 89	724 53	5,478 42	
Lardeau.....	203 63	130 59	334 22	
Lloyd's Creek.....	1,791 80	802 38	2,594 18	
Nelson.....	4,477 30	1,017 20	5,494 50	
Pemberton.....	5,876 48	673 82	6,550 30	
Penask.....	1,709 80	1,241 69	2,951 49	
Pitt.....	3,851 24	374 45	4,225 69	
Rivers Inlet.....	7,445 34	1,074 29	8,519 63	
Summerland.....	191 64	576 74	768 38	
Supervisor, Engineer and Staff.....	8,094 00	366 79	8,460 79	
General Account.....		1,668 71	1,668 71	
General Account (Beaver Lake).....	766 59	310 47	1,077 06	
General Account (Cranbrook).....		1,634 73	1,634 73	
General Account (Fish Lake).....	299 40	126 67	426 07	
General Account (Furunculosis).....	400 16	141 32	541 48	
General Account (Gerrard).....	36 00		36 00	
General Account (Harrison).....	1,191 36	322 53	1,513 89	
General Account (Lac La Hache).....	24 00	14 91	38 91	
General Account (Nicomekl and Serpentine River).....	32 50	267 27	299 77	
General Account (Okanagan).....	451 00	1,343 88	1,794 88	
General Account (Paul Creek).....	200 00	99 96	299 96	
General Account (Qualicum).....		975 61	975 61	
General Account (Tlell-Mecintin).....	608 17	400 01	1,008 48	
General Account (Duck and Woods).....		60 00	60 00	
				88,062 63
<i>Fish Culture—Total.....</i>	<i></i>	<i></i>	<i></i>	<i>231,036 57</i>

## DEPARTMENT OF FISHERIES

## SUMMARY

Hatcheries	Personal Services	Other Outlay	Total by Hatcheries	Grand Total
	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Nova Scotia.....	36,062 18	42,408 85	78,471 03	
Prince Edward Island.....	3,946 05	1,355 88	5,301 93	
New Brunswick.....	28,326 19	19,040 21	47,366 40	
General Account—East.....	1,807 30	3,187 93	4,995 23	
Supervisor, Engineer and Staff—East.....	5,058 00	1,781 35	6,839 35	
British Columbia.....	66,209 20	21,853 43	88,062 63	
	141,408 92	89,627 65		231,036 57

DETAILED STATEMENT OF CONSERVATION AND DEVELOPMENT OF DEEP-SEA  
FISHERIES EXPENDITURE 1935-36

Aids in Expanding Demands for Fish.....	\$ 3,033 92	
Packet Service—L'Ardoise, N.S.....	1,500 00	
Educational Work.....	11,914 33	
Bait Collection—Canso, N.S.....	981 90	
Grant to "Canadian Fishermen".....	1,500 00	
Grants to Exhibitions, N.S.....	2,050 00	
Exhibitions.....	1,120 54	
Bait Freezer—Petit de Grat, N.S.....	100 00	
Destruction of Sea Lions, B.C.....	86 46	
Transshipment of Fur Seal Skins, B.C.....	1,681 56	
Inspection into Food of Fur Seals, B.C.....	1,720 56	
Fisheries Intelligence Service.....	3,163 83	
General Account.....	10,275 05	
		39,128 15

## MARINE BIOLOGICAL BOARD STATEMENT OF EXPENDITURE, 1935-36

<i>St. Andrews Biological Station</i> .....	\$ 40,372 59	
Atlantic salmon investigation.....	410 98	
Cod and haddock investigation.....	1,444 35	
Cultural investigation.....	1,075 72	
General lakes survey.....	219 39	
Lobster investigation.....	595 55	
Oyster investigation.....	296 93	
Scallop investigation.....	90 41	44,505 92
<i>Nanaimo Biological Station</i> .....	41,551 61	
Chemical investigation.....	1,029 07	
Cowichan River investigation.....	656 48	
Okanagan Lake survey.....	761 42	
Pacific salmon investigation.....	2,960 04	
Pacific trout investigation.....	427 19	
Pilchard and herring investigation.....	653 31	
Pink and chum salmon investigation.....	2,133 28	
Shellfish investigation.....	904 84	51,082 24
<i>Halifax Experimental Station</i> .....	35,973 82	
Investigations.....	3,784 49	
Sundry.....	172 40	39,930 71
<i>Prince Rupert Experimental Station</i> .....	30,684 21	
Investigations.....	1,167 24	31,851 45
<i>General Account</i> .....		21,368 24
Total Biological Board.....		\$ 188,738 56
<i>5% Restorations—</i>		
St. Andrews.....	1,618 04	
Nanaimo.....	1,638 29	
Halifax.....	1,296 60	
Prince Rupert.....	1,169 08	
General Account.....	489 61	6,211 62
Total Biological Board including 5% Restoration.....		\$ 194,950 18





# APPENDIX No. 8

## LICENCES ISSUED

Following is a Statement of the different kinds of Licences issued by the different Supervisors during the 1935-36 season.

### MAGDALEN ISLANDS, QUEBEC—SUPERVISOR S. T. GALLANT

Kind of Licences	Number of Licences issued
Lobster fishing licences.....	931
Certificates of identification.....	Nil
Licences to can lobsters.....	16
Certificates under section 53—3	
Herring seine licences.....	18
Herring trap-net licences.....	22 (8 cod trap-nets)
Smelt gill-net licences.....	123
Smelt bag-net licences.....	2
	<hr/> 1,112 (8 cod trap-nets)

### PRINCE EDWARD ISLAND—SUPERVISOR S. T. GALLANT

Lobster fishing licences.....	2,726
Certificates of identification—58 (5 cancelled).	
Licences to can lobsters.....	90
Oyster fishery licences.....	347
Quahaug fishery licences.....	50
Certificates under section 53—4.	
Lobster pound licences.....	1 (1 cancelled)
Trap-net fishing licences.....	6
Salmon trap-net or pound-net licences.....	1
Set salmon gill-net licences.....	7
Gaspereau gill-net permits.....	11
Scallop fishery licences.....	Nil
Smelt gill-net licences.....	170
Smelt bag-net licences.....	200 (1 box-net)
Leases of oyster privileges—104 (1 cancelled).	
	<hr/> 3,609 (1 cancelled & 1 box-net)

### NOVA SCOTIA—DISTRICT No. 1—SUPERVISOR A. G. McLEOD

Lobster fishing licences.....	2,959 (1 cancelled)
Certificates of identification—16.	
Licences to can lobsters.....	30
Oyster fishery licences.....	223
Certificates under section 53—40.	
Trap-net fishing licences.....	28
Salmon trap-net, pound-net or weir licences.....	279 (1 cancelled)
Special angling permits.....	122
Set salmon gill-net licences.....	30
Gaspereau fishing licences.....	Nil
Smelt bag-net licences.....	39
Smelt gill-net licences.....	109
	<hr/> 3,819 (2 cancelled)

### NOVA SCOTIA—DISTRICT No. 2—SUPERVISOR E. D. FRASER

Lobster fishing licences.....	4,555 (6 cancelled)
Certificates of identification—216 (5 cancelled and 1 duplicate).	
Licences to can lobsters.....	48
Oyster fishery licences.....	181
Quahaug fishery licences.....	12
Shad gill-net or drift-net licences.....	68
Certificates under section 53—69.	
Lobster pound licences.....	5
Seine licences.....	106
Licences to a captain of a Canadian fishing vessel (using an otter or other trawl)	3
Herring weir licences.....	14
Trap-net fishing licences.....	105
Salmon drift-net licences.....	55
Salmon trap-net, pound-net or weir licences.....	199
Special angling permits.....	103 (5 complimentary)
Set salmon gill-net licences.....	378
Scallop fishery licences.....	2
Smelt bag-net licences.....	189
Smelt gill-net licences.....	283
Lobster pound certificates—155.	
	<hr/> 6,306 (6 cancelled and 5 complimentary)

## NOVA SCOTIA—DISTRICT No. 3—SUPERVISOR H. H. MARSHALL

Kind of Licences	Number of Licences issued
Lobster fishing licences.....	3,203
Certificates of identification—32.	
Shad gill-net or drift-net licences.....	1
Certificates under section 53—153.	
Lobster pound licences.....	11
Herring weir licences.....	42
Trap-net fishing licences.....	160
Salmon drift-net licences.....	2
Salmon trap-net, pound-net or weir licences.....	64
Salmon net permits (Medway river).....	31
Special angling permits.....	528 (4 complimentary and 3 cancelled)
Set salmon gill-net licences.....	423
Scallop fishery licences.....	113
Smelt bag-net licences.....	23
Smelt gill-net licences.....	45
Lobster pound certificates—794 (2 cancelled).	
Lease of Long Beach Pond—1.	
	4,646 (3 cancelled and 4 complimentary)

## NEW BRUNSWICK—DISTRICT No. 1—SUPERVISOR J. F. CALDER

Lobster fishing licences.....	450
Certificates of identification—19.	
Shad gill-net or drift-net licences.....	33
Certificates under section 53—2.	
Lobster pound licences.....	4
Herring weir licences.....	558
Clam permits.....	126
Salmon gill-net or drift-net licences.....	107
Herring seine licences.....	Nil
Scallop fishery licences.....	35
Smelt gill-net licences.....	Nil
Smelt bag-net or box-net licences.....	Nil
Lobster pound certificates—693 (2 missing).	
Lease of Dark Harbour fishing privileges—1.	
	1,313

## NEW BRUNSWICK—DISTRICT No. 2—SUPERVISOR A. L. BARRY

Lobster fishing licences.....	3,329 (27 free)
Certificates of identification—340 (3 cancelled).	
Licences to can lobsters.....	87 (1 cancelled)
Oyster fishery licences.....	933 (37 free)
Quahaug fishery licences.....	72
Shad gill-net or drift-net licences.....	1
Certificates under section 53—307.	
Lobster pound licences.....	3
Herring weir licences.....	Nil
Gaspereau pound-net or trap-net licences.....	108
Salmon gill-net or drift-net licences.....	192
Salmon trap-net, pound-net or weir licences.....	386
Tomcod trap-net licences.....	4
Bass fishery licences.....	Nil
Smelt gill-net licences.....	360
Smelt bag-net or box-net licences.....	4,679 (4 cancelled and 50 free)
Black salmon angling permits.....	21
Lobster pound certificates—198 (1 missing and 1 blank).	
	10,175 (5 cancelled and 114 free)

## NEW BRUNSWICK—DISTRICT No. 3—SUPERVISOR L. H. PARKS

Shad gill-net or drift-net licences.....	155
Sturgeon fishery licences.....	2
Whitefish fishery licences.....	Nil
Salmon net permits (St. John river).....	114
Gaspereau pound-net or trap-net licences.....	1
Salmon gill-net or drift-net licences.....	161
Salmon trap-net, pound-net or weir licences.....	97
Gaspereau gill-net licences.....	137
Shad dip-net fishing permits.....	23
Pickereel permits (hook and line).....	11
Pickereel permits (net fishing).....	2
Whitefish gill-net permits (Grand lake-Chiputneticook System).....	52
Bass fishery licences.....	15
Black salmon angling permits.....	385
Receipt books—423 (2 cancelled and 1 missing).	
	1,155



## DEPARTMENT OF FISHERIES

## HUDSON BAY AND JAMES BAY

Kind of Licences	Number of Licences Issued
Permits (issued for scientific purposes).....	2
Permit (gill-nets and drag-seines).....	1
Gill-net permits.....	6 (6 cancelled)
	<hr/> 9 (6 cancelled)

## PROVINCE OF BRITISH COLUMBIA—CHIEF SUPERVISOR, J. A. MOTHERWELL

Small dragger licences.....	29 (1 cancelled)
Special angling permits.....	660 (4 cancelled)
Indian permits.....	2,078
Crab fishery licences.....	116
Smelt or sardine fishery licences.....	48 (1 cancelled)
Miscellaneous licences.....	118 (4 cancelled)
Salmon fishery licences.....	4,965 (99 cancelled)
Salmon trolling licences.....	3,038 (12 cancelled)
Salmon trap-net licences.....	8
Salmon drag-seine licences.....	9
Salmon purse-seine licences.....	293 (3 cancelled)
Licence to a captain of a salmon purse seine boat.....	165
Grayfish fishery licences.....	112
Licence to assistant operator of salmon (purse or drag) seine.....	1,672 (2 cancelled)
Licence to assistant in a boat used in operating a salmon gill-net or drift-net....	957 (2 cancelled)
Cod fishery licences.....	428 (11 cancelled)
Whaling licences.....	6
Licence to a captain of a Canadian halibut fishing boat.....	3
Herring gill-net or drift-net licences.....	26 (1 cancelled)
Herring purse-seine licences.....	27
Pilchard purse-seine licences.....	27
Licence to a captain of a herring purse-seine boat.....	19
Licence to a captain of a pilchard purse-seine boat.....	21
Licence to assistant operators of herring purse-seines.....	303
Licence to assistant operators of pilchard purse-seines.....	137
Herring pound permits.....	9
Pelagic sealing certificates—12.	
Receipt books—Nil.	
	<hr/> 15,268 (140 cancelled)

## YUKON TERRITORY

Special fishery licences.....	28
-------------------------------	----

## PACIFIC COAST

Licences to United States halibut fishing vessels.....	192
--	-----

## ATLANTIC COAST

Licences to United States fishing vessels.....	80
--	----

## NORTHWEST TERRITORIES

Reduction works licences.....	3
Walrus licences.....	33 (incomplete)
Special angling permits.....	Nil
	<hr/> 36
Total.....	47,748 (163 cancelled, 114 free, 9 complimentary, 1 box-net and 8 cod trap-nets)

# APPENDIX No. 9

## COMPARATIVE STATEMENT OF LOBSTER FISHING LICENCES FROM 1928

### PRINCE EDWARD ISLAND AND MAGDALEN ISLANDS

Year	Magdalen Island	Prince County	Kings County	Queens County	Kings and Queens (Southern portion)	Totals
1928.....	682	925	616	337	.....	2,560
1929.....	659	857	509	271	.....	2,296
1930.....	644	922	573	285	.....	2,424
1931.....	526	894	521	283	.....	2,224
1932.....	526	1,409	308	402	398	3,043
1933.....	599	1,359	324	438	485	2,606
1934.....	825	1,190	483	459	542	3,499
1935.....	931	1,110	538	487	591	3,657

### NOVA SCOTIA—DISTRICT No. 1

Year	Inverness County	Richmond County	Cape Breton County	Victoria County	Totals
1928.....	537	648	462	376	2,023
1929.....	501	636	435	329	1,901
1930.....	496	682	442	343	1,963
1931.....	473	745	458	367	2,043
1932.....	542	897	578	426	2,443
1933.....	656	1,092	773	534	3,055
1934.....	701	1,060	790	561	3,112
1935.....	738	1,026	691	503	2,958

### NOVA SCOTIA—DISTRICT No. 2

Year	Halifax Office	Halifax County	Patrol Boat	Guys- boro County	Antig- onish County	<sup>a</sup> Pictou and Col- chester	<sup>a</sup> Cum- berland County	<sup>b</sup> Hants Col- chester and Cum- berland County	Totals
1928....	183	976	41	1,021	334	521	171	17	3,264
1929....	153	767	435	1,047	283	358	221	7	3,271
1930....	131	1,135	204	1,087	308	349	255	9	3,478
1931....	142	1,200	170	1,139	273	352	299	15	3,590
1932....	105	1,364	14	1,330	339	462	399	14	*4,029
1933....	68	1,453	59	1,439	350	526	374	18	4,287
1934....	20	1,342	24	1,489	425	589	431	22	4,342
1935....	5	1,435	24	1,473	494	685	426	7	4,549

<sup>a</sup> Northumberland Straits side.

<sup>b</sup> Bay of Fundy side.

\* The 1932 total includes two licences issued by the District Supervisor.

## DEPARTMENT OF FISHERIES

## NOVA SCOTIA—DISTRICT No. 3

Year	Lunen- burg	Queens	Shel- burne	Yar- mouth	Digby	Kings	Anna- polis	Total
1928.....	563	329	966	827	470	25	119	3,299
1929.....	472	217	850	792	463	27	120	2,941
1930.....	504	250	854	768	483	28	135	3,022
1931.....	590	296	1,016	770	430	.....	128	3,230
1932.....	491	290	965	673	312	.....	148	2,879
1933.....	525	262	1,112	720	415	21	141	3,196
1934.....	481	287	1,014	705	354	24	114	2,979
1935.....	562	307	1,100	758	370	21	85	3,203

## NEW BRUNSWICK—DISTRICT No. 1

Year	Charlotte	Saint John	Albert and West- morland	Total
1928.....	433	86	1	520
1929.....	360	53	1	414
1930.....	288	57	2	347
1931.....	281	45	4	330
1932.....	380	101	2	483
1933.....	271	99	1	371
1934.....	*299	94	1	394
1935.....	a362	87	1	450

## NEW BRUNSWICK—DISTRICT No. 2

Year	Northum- berland County	Resti- gouche County	Gloucester County	Kent County	West morland County	Totals
1928.....	297	50	517	501	249	*1,981
1929.....	289	43	406	583	188	*1,834
1930.....	319	46	794	638	327	2,124
1931.....	300	54	647	765	326	2,192
1932.....	394	67	933	997	435	2,826
1933.....	407	77	1,041	989	720	3,234
1934.....	512	74	1,064	1,087	905	3,642
1935.....	509	80	986	1,035	719	3,329

\* The 1928 total includes 367 licences issued by the District Supervisor, the 1929 total 325 licences, the 1934, 3 licences, and 1935 one licence, so issued.

NOTE.—Cancelled licences are not included in the figures in this appendix.



## APPENDIX No. 10

Return showing details of prosecutions for offences against the Fisheries Act during the fiscal year 1935-36.

## NOVA SCOTIA—DISTRICT No. 1—SUPERVISOR A. G. McLEOD

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	John Blackwood.....	Fishing for trout in the New Boston closed area...	Bell's lake.....	Fined \$7.50 and costs, \$2.50.
2	James McMullen.....	Fishing for trout in the New Boston closed area...	Bell's lake.....	Fined \$7.50 and costs, \$2.50.
3	Charles McGillivray.....	Possessing berried lobsters.....	Victoria Mines.....	Fined \$25 and \$5.70 costs; fine suspended and costs paid by defendant.
4	William Young.....	Possessing berried lobsters.....	Victoria Mines.....	Fined \$15 and costs of \$7.70.
5	Edward Young.....	Possessing berried lobsters.....	Victoria Mines.....	Fined \$15 and costs, \$7.70.
6	Joseph S. Carnus.....	Fishing lobsters in close season.....	Point Edward.....	Fined \$5 and costs, \$2.50.
7	Peter McLellan.....	Alleged spearing of salmon.....	Margaree river.....	Case dismissed; costs, \$17.40, levied against complainant and paid by defendant.

## NOVA SCOTIA—DISTRICT No. 2—SUPERVISOR E. D. FRASER

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	Bessie G. Mader.....	Possession trout closed season.....	Halifax.....	Fined \$3 and costs, \$1.50.
2	Josie Pelrine.....	Fishing lobsters without licence.....	Larry's river.....	Fined \$2.
3	Clement Pelrine.....	Fishing lobsters without licence.....	Larry's river.....	Fined \$1.
4	Paul Avery.....	Fishing lobsters without licence.....	Larry's river.....	Fined \$1.
5	Oliver Richard.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
6	Leonard Richard.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
7	Vessie Richard.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
8	Peter O. Richard.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
9	Wallace Richard.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
10	Raymond Richard.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
11	Peter C. Richard.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
12	Wilfred Richard.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
13	Wilfred Levangie.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
14	Thomas L. Richard.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
15	Harold Richard.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
16	Clement Richard.....	Fishing lobsters without licence.....	Charles cove.....	Fined \$1.
17	Joseph Mason.....	Fishing lobsters without licence.....	Whitehead.....	Fined \$1.
18	Clarence Pelrine.....	Fishing lobsters without licence.....	Whitehead.....	Fined \$1.
19	Stanley Bellfontain.....	Fishing lobsters without licence.....	Port Felix.....	Fined \$1.
20	Barney Pelrine.....	Fishing lobsters without licence.....	Port Felix.....	Fined \$1.
21	Ernest Casey.....	Fishing lobsters without licence.....	Port Felix.....	Fined \$1.
22	Sylvester DeCoste.....	Fishing lobsters without licence.....	Port Felix.....	Fined \$2.
23	Ross Feltmate.....	Fishing lobsters without licence.....	Port Felix.....	Fined \$1.
24	Alex C. McDonald.....	Fishing lobsters without licence.....	Port Felix.....	Fined \$1.
25	Andrew Horne.....	Sawdust pollution.....	Whitehead.....	Fined \$1.
26	William Bond.....	Fishing lobsters without licence.....	Vamey's brook.....	Fined \$20 and costs, \$2.50.
27	Neil Sullivan.....	Fishing lobsters without licence.....	Dover.....	Fined \$1.
28	Charles O. Gammon.....	Fishing lobsters without licence.....	Dover.....	Fined \$1.
29	Bruce Burke.....	Fishing lobsters without licence.....	Canso.....	Fined \$1.
30	George Burke.....	Fishing lobsters without licence.....	Whitehead.....	Fined \$1.
31	Wallace Burke.....	Fishing lobsters without licence.....	Whitehead.....	Fined \$1.
32	Isaac Thorpe.....	Fishing lobsters without licence.....	Drum Head.....	Fined \$1.
33	Percy Canavan.....	Sawdust pollution.....	Drum Head.....	Fined \$1.
34	George Peitzsch.....	Sawdust pollution.....	Ashtdale.....	Fined \$20 and costs, \$5.90.
35	Calvin Langille.....	Fishing lobsters without licence.....	Hillvale.....	Fined \$20 and costs, \$13.40.
36	Harold Burke.....	Fishing lobsters without licence.....	Goldboro.....	Fined \$1.
37	Kent Darr.....	Fishing lobsters without licence.....	Isaac's harbour.....	Fined \$1.
38	Lester Umlah.....	Illegal lobster fishing.....	Drum Head.....	Fined \$1.
39	Zenas Harnish.....	Illegal smelt fishing.....	Ecum Secum.....	Fined \$10 and costs, \$5.70.
		Illegal trout fishing.....	Hatchett lake.....	Fined \$10 and costs, \$5.60.
			Cranberry lake.....	Fined \$25 and costs, \$5.30 or 1 month in jail; case appealed—conviction sustained; took jail sentence.

40	Wesley Harnish.....	Illegal trout fishing.....	Cranberry lake.....	Fined \$25 and costs, \$5.30 or 1 month in jail; case appealed—conviction sustained; took jail sentence.
41	William L. Jamieson.....	Fishing lobsters without licence.....	Peasbrook.....	Fined \$1.
42	Phillip DeBaie.....	Fishing lobsters out of season.....	Halifax harbour.....	Fined \$100 and costs, \$9.35 or 2 months in jail; took jail sentence; 1 row boat and oars and 7 hand pots confiscated and hand pots destroyed.
43	Louis Pe tipas.....	Fishing lobsters out of season.....	Halifax harbour.....	Fined \$100 and costs, \$9.35 or 2 months in jail; took jail sentence.
44	Seymour Cameron.....	Sawdust pollution.....	Watervale brook.....	Fined \$20 and costs, \$7.
45	Raymond Goddard.....	Fishing salmon with jig hooks.....	Crawford's falls.....	Fined \$25 and costs, \$3.75; 1 fishing rod, line and hooks confiscated.
46	Clarence Walker.....	Fishing trout out of season.....	Musquodoboit river.....	Fined \$25 and costs, \$2.75 or 30 days in jail; 1 rod and line confiscated.
47	Wylie Ralph.....	Illegal lobster fishing.....	Off Brule shore.....	Fined \$3 and costs, \$4.65.
48	Seymour Cameron.....	Sawdust pollution.....	Watervale brook.....	Fined \$40 and costs, \$7.
49	St. Andrews Community Industries.....	Sawdust pollution.....	South river.....	Case dismissed; costs, \$4.35 to be paid by the department.
50	Rodney Gunn.....	Possession salmon closed season.....	Middle river.....	Fined \$50 and costs, \$6.65 or two months in jail; 1 pack and salmon confiscated.
51	Oscar Seaton, Jr.....	Illegal salmon fishing.....	Milford Station.....	Fined \$5 and costs, \$16.05.
52	Gerald Pettipas.....	Illegal lobster fishing.....	Halifax harbour.....	Fined \$100 and costs, \$5.60 or 2 months in jail; went to jail; costs to be paid by department; 1 pair oars, 1 boat and 7 hand pots confiscated.
53	Garnet Black.....	Possession salmon closed season.....	Amherst.....	Fined \$10 and costs, \$2.50.
54	Atlee Chapman.....	Possession salmon closed season.....	Amherst.....	Fined \$10 and costs, \$2.50; 1 salmon confiscated.
55	George Goddard.....	Fishing salmon and trout with jig hooks.....	Musquodoboit river.....	Fined \$25—later reduced to \$2 and costs, \$7.50.
56	Everett Russell.....	Fishing smelts by means of dip nets.....	Lower Porter's lake.....	Fined \$10 and costs, \$13.40; 1 dip net confiscated; appealed and allowed by the County Court.
57	Arthur Pettipas.....	Fishing smelts by means of dip nets.....	Lower Porter's lake.....	Fined \$10 and costs, \$13.40; 1 dip net confiscated; appealed and allowed by the County Court.
58	Archibald MacMillan.....	Sawdust pollution.....	Pencil brook.....	Fined \$20 and costs, \$2.50.
59	J. J. Collier.....	Sawdust pollution.....	Taylor's brook.....	Fined \$20 and costs, \$2.50.
60	Lucien Deschene.....	Fishing trout out of season.....	East river.....	Fined \$10 and costs, \$2.55 or ten days in jail; committed to jail and costs paid by the department; 1 rod and line confiscated.



No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	Dennis Surette.....	Under-sized lobsters in possession.....	Lower Melbourne, Yarmouth co.....	Fined \$5 and costs of \$3.85; 41 lobsters given to Old Ladies' Home.
2	Joseph Sibley.....	Illegal dipping and retaining smelts.....	Marshalltown, Digby co.....	Fined \$2; dip-net destroyed and smelts given to Alms House.
3	Freeman Sibley.....	Illegal dipping and retaining smelts.....	Marshalltown, Digby co.....	Fined \$2; dip-net destroyed and smelts given to hospital.
4	John Saulnier.....	Illegal possession of lobsters.....	Saulnierville, Digby co.....	Fined \$2.40 and costs of \$6.75; 12 lobsters confiscated and destroyed (unit for food)
5	John Oxner.....	Illegal possession of lobsters.....	Lunenburg.....	Fined \$5 and costs of \$5.50.
6	Solomon Fritzenburg.....	Illegal possession of lobsters.....	Lunenburg.....	Fined \$5 and costs \$5.50.
7	Clement Hiltz.....	Illegal possession of lobsters.....	Lunenburg.....	Fined \$5 and costs \$5.50.
8	John Shaw.....	Illegal dipping.....	Round Hill, Annapolis co.....	Fined \$1.
9	Clifford Muise.....	Illegal gaspereau fishing.....	Melbourne, Yarmouth co.....	Fined \$2 or 10 days in gaol; went to gaol; costs \$8.50 to be paid by department; dip-net destroyed.
10	Wm. Muise.....	Illegal gaspereau fishing.....	Melbourne, Yarmouth co.....	Fined \$2 or 10 days in gaol; went to gaol; costs \$3.50 to be paid by department; dip-net destroyed.
11	Leaman Corkum.....	Illegal lobster fishing.....	Eastern Point, Lunenburg co.....	Fined \$5.
12	Kenneth Roy.....	Illegal lobster fishing.....	S.W. Port Mouton, Queens co.....	Fined \$1.
13	Henry Fisher.....	Illegal lobster fishing.....	S.W. Port Mouton, Queens co.....	Fined \$1.
14	Abden Burgess.....	Illegal lobster fishing.....	S.W. Port Mouton, Queens co.....	Fined \$1.
15	Elmer Little.....	Illegal salmon fishing.....	Tusket, Yarmouth co.....	Fined \$20 and costs, \$7.05; 1 salmon gill-net confiscated and destroyed.
16	Robert Allen.....	Illegal salmon fishing.....	Gavelton, Yarmouth co.....	Fined \$20 and costs, \$7.05.
17	Aubrey Moland.....	Fishing salmon without licence.....	East Chester, Lunenburg co.....	Fined \$3.
18	Leaman Wentzell.....	Sawdust pollution.....	Newburn, Lunenburg co.....	Case dismissed; costs to be paid by department.
19	Lewis Hatt.....	Netting salmon.....	Beach Hill.....	Fined \$10 or 10 days in gaol; went to gaol; costs \$11.75 to be paid by department.
20	Thomas Wilson.....	Netting salmon.....	Beach Hill.....	Fined \$10 or 10 days in gaol; went to gaol; costs \$11.75 to be paid by department.
21	Fenwick Tanner.....	Illegal possession of lobsters.....	Stonehurst.....	Fined \$50 and costs, \$8.75; moiety paid to complainant.
22	Bernard W. Falkenham.....	Possession of under-sized lobsters.....	Lunenburg.....	Case dismissed; costs to be paid by department.
23	Austen Atwell.....	Illegal netting.....	South Tremont, Kings co.....	Fined \$15 and costs, \$7.50; 1 sweep-net destroyed.
24	Alden Atwell.....	Illegal netting.....	South Tremont, Kings co.....	Fined \$15 and costs \$5.55; 1 sweep-net confiscated and destroyed.
25	William Olsen.....	Illegal lobster fishing.....	Yarmouth bar, Yarmouth co.....	Fined \$5 and costs, \$6.35; paid to R.C. M.P.

26	Freeman Forbes.....	Illegal lobster fishing.....	Yarmouth south, Yarmouth co. ....	Fined \$10 and costs, \$6.60; paid to R.C. M.P.
27	Charles Fevens.....	Illegal lobster fishing.....	Yarmouth south, Yarmouth co. ....	Fined \$10 and costs, \$6.60; paid to R.C. M.P.
28	Gladys Fitzgerald.....	Illegal possession of lobsters.....	Corneau's Hill, Yarmouth co. ....	Fined \$10 and costs, \$7.60; paid to R.C. M.P.
29	James Churchill.....	Illegal possession of lobsters.....	Yarmouth.....	Fined \$10 and costs, \$7.60; paid to R.C. M.P.
30	Frank Ward.....	Sawdust pollution.....	North Alton, Kings co. ....	Fined \$20 and costs, \$8.90.
31	Norman Dulong.....	Dipping gaspereau.....	Tusket, Yarmouth co. ....	Fined \$2 and costs, \$8.75; paid to R.C. M.P.; 1 dip-net confiscated and destroyed, 30 gaspereau given to Salvation Army.
32	James Muise.....	Dipping gaspereau.....	Belleville, Yarmouth co. ....	Fined \$2 or 20 days in gaol; went to gaol; costs, \$7.35 to be paid by department; 1 dip-net confiscated and destroyed, 15 gaspereau given to Salvation Army.
33	Vernon J. Morton.....	Dipping gaspereau.....	Yarmouth.....	Fined \$2 or 20 days in gaol; went to gaol; costs, \$7.35 to be paid by department; 1 dip-net confiscated and destroyed; 30 gaspereau given to Salvation Army.

## NEW BRUNSWICK—DISTRICT No. 1—SUPERVISOR, J. F. CALDER

1	Joseph Calder.....	Fishing for lobsters without a licence.....	Schooner cove, Campobello... ..	Fine of \$25 imposed and allowed to stand for future good behaviour.
2	Joseph Worthen.....	Having illegal lobsters in his possession.....	East side Rosses island, Grand Manan.....	Fined \$15.
3	Clifford Stanley.....	Having illegal lobsters in his possession.....	East side Rosses island, Grand Manan.....	Fined \$15.
4	Sherman Griffin.....	Having illegal lobsters in his possession.....	Wood island, Grand Manan.....	Fined \$10 or 15 days in jail; went to gaol.
5	Edmond Cormier.....	Having oysters in his possession during close season.....	Moncton.....	Fined \$10.
6	Andrew Nelson and Bartol Anderson.....	Having lobsters in their possession during close season.....	Grand Manan, Charlotte co. ....	Case dismissed.
7	Heber Brown and Penton Brown.....	Having lobsters in their possession during close season.....	Grand Manan, Charlotte co. ....	Charge withdrawn.
8	Carl Frost and Preston Harvey.....	Having lobsters in possession during close season.....	Grand Manan, Charlotte co. ....	Charge withdrawn.
9	Edward Thomas and Leamon Harvey.....	Having lobsters in possession during close season.....	Grand Manan, Charlotte co. ....	Not guilty.
10	Leslie Ayles.....	Fishing for salmon illegally.....	Coverdale river, Albert co. ....	Fined \$10.
11	Lewis Russell.....	Illegally fishing for salmon.....	Near Leamon bridge, Coverdale river, Albert co. ....	Fined \$10 or 30 days in gaol; went to jail.
12	Chesley Butland.....	Illegally fishing for salmon.....	Salmon river at Alma, Albert co. ....	Fined \$10.
13	Thomas Martin.....	Illegally fishing for salmon.....	Salmon river, Alma, Albert co. ....	Fined \$10.

NEW BRUNSWICK DISTRICT No. 1—*Concluded*

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
14	Chesley Butland.....	Illegally fishing for salmon.....	Salmon river, Alma, Albert co.	Fined \$15.
15	William Harkins.....	Illegally fishing for salmon.....	Bay of Fundy waters of Saint John county.	Suspended sentence.
16	Roscoe Armstrong.....	Illegally fishing for salmon.....	Bay of Fundy waters of Saint John county.	Suspended sentence.
17	Wilnot B. Guptill.....	Sold hard cured smoked round herring without being inspected in contravention of Fish Inspection Act.	Grand Manan, Charlotte co.	Fined \$5 and \$14.00 costs, or 20 days' imprisonment.
18	Joseph Chaplin.....	Selling salmon at a time when sale of such fish was prohibited by law.	Moncton.....	Case dismissed; costs amounting to \$22.30 to be paid by department.

## NEW BRUNSWICK—DISTRICT No. 2—SUPERVISOR, A. L. BARRY

1	William Forrest.....	Failure to observe salmon weekly close time.....	Miramichi river.....	Fined \$2 and costs, \$9.55.
2	Octave Mauzeroll.....	Having 26 smelts in possession in close time.....	Little river, Kent co.....	Fined \$2 and costs, \$3.
3	William Campbell.....	Having 15 smelts in possession in close time.....	Little river, Kent co.....	Fined \$2 and costs, \$2.
4	Peter Casey.....	Shipping lobsters close season without permit.....	Inkerman.....	Fined \$50 and costs, \$4.50.
5	Thomas St. Pierre.....	Selling oysters in close season.....	Moncton.....	Fined \$10 and costs, \$8.
6	Amedee Despres.....	Fishing for oysters during close season.....	Cocagne bay.....	Fined \$2 and costs, \$1.
7	Albenie Despres.....	Fishing for oysters during close season.....	Cocagne bay.....	Fined \$2 and costs, \$1.
8	Theodule N. Roy.....	Assisting, and fishing for smelts during close season.....	Little Elm Tree river.....	Guilty. Admonished.
9	N. P. Roy.....	Assisting, 2 men fishing smelts close season.....	Little Elm Tree river.....	Guilty. Admonished.
10	Wm. G. Mills.....	Drifting for salmon inside statutory line.....	Miramichi bay.....	Fined \$5 and \$1.25 costs.
11	C. F. Girouard.....	Having illegally caught lobsters in possession.....	Buctouche.....	Fined \$1 and \$3.50 costs.
12	Yvon LeBlanc.....	Violation Sec. 14, Lobster Fishery Regulations.....	Northumberland strait.....	Not guilty.
13	Henry Gauvin.....	Violation Sec. 14, Lobster Fishery Regulations.....	Northumberland strait.....	Not guilty.
13a	Henry Herbert.....	Violation Sec. 14, Lobster Fishery Regulations.....	Northumberland strait.....	Information withdrawn.
13b	Albert McKay.....	Fishing for lobsters without licence.....	Near Cape Tormentine.....	Not guilty.
14	Omer Mazzerolle.....	Violation Sec. 14, Lobster Fishery Regulations.....	Off Point Sapin.....	Fined \$25 or 30 days jail; 1 boat and equipment confiscated.
15	Alphonse Boucher.....	Having in possessions lobsters in close season.....	Northumberland strait.....	Fined \$25 and costs, \$5.79 or 30 days in jail.
16	Ferdinand King.....	Violation Sec. 14, Lobster Fishery Regulations.....	Northumberland strait.....	Fined \$25 and costs, \$5.79 or 30 days in jail; motor boat and equipment confiscated.
17	Yvon Richard.....	Violation Sec. 14, Lobster Fishery Regulations.....	Northumberland strait.....	Fined \$25 and costs, \$5.79 or 30 days in jail.
18	Madore Maillet.....	Violation Sec. 14, Lobster Fishery Regulations.....	Northumberland strait.....	Fined \$25 and costs, \$5.79 or 30 days in jail.



19	Cyril Maillet.....	Violation Sec. 14, Lobster Fishery Regulations.....	Northumberland strait.....	Fined \$25 and costs, \$5.79 or 30 days in jail.
20	Adelard Richard.....	Having in possession lobsters close season.....	Northumberland strait.....	Fined \$25 and costs, \$5.79 or 30 days in jail.
21	Laurie Allain.....	Leaving shore for fishing grounds before opening hour, lobster fishing.....	Richibucto cape.....	Fined \$25 and costs, \$6.95 or 30 days in jail.
22	Laurie Allain.....	Obstructing an officer in discharge of duty.....	Richibucto cape.....	Fined \$1 and \$2.50 costs, plus R.C.M.P. costs or 60 days in jail.
23	Octage Richard.....	Having in possession lobsters in close season.....	Cote St. Anne.....	Fined \$25 and costs, \$10.25 or 30 days in jail.
24	Albert Robichaud.....	Having in possession lobsters in close season.....	Northumberland strait.....	Fined \$25 and costs, \$10.25 or 30 days in jail.
25	Lionel Richard.....	Leaving shore for fishing grounds before opening hour.....	Richibucto cape.....	Fined \$25 and costs, \$6.95 or 30 days in jail.
26	Lionel Richard.....	Obstructing officer in discharge of duties.....	Cape Lumiere.....	Fined \$1 and costs, \$2.50, plus R.C.M.P. costs, or 60 days in jail.
27	Ambrose Babineau.....	Having in possession lobsters in close season.....	Northumberland strait.....	Fined \$25 and costs, \$6.45 or 30 days in jail; 1 motor boat confiscated.
28	Oliva Maillet.....	Having in possession lobsters in close season.....	Northumberland strait.....	Fined \$25 and costs, \$6.45 or 30 days in jail.
29	Arthur LeGoof.....	Violation of Sect. 14 (a) Lobster Fishery Regulations.....	Northumberland strait.....	Fined \$10 and costs, \$9.50 or 15 days in jail.
30	Maxime Doucet.....	Violation Sect. 14 (a) Lobster Fishery Regulations.....	Northumberland strait.....	Fined \$10 and costs, \$4.75 or 15 days in jail.
31	Fred Landry.....	Having in possession lobsters in close season.....	Northumberland strait.....	Fined \$25 and costs, \$3.50 or 30 days in jail; 1 motor boat and equipment confiscated.
32	Emile Cormier.....	Having in possession 14 bottles shucked oysters.....	Road near Moncton.....	Fined \$1 and costs, \$2.50; 1 Ford coupe and 14 bottles oysters confiscated.
33	Sebastien Russell.....	Having in possession lobsters in close season.....	Point au Barreau.....	Fined \$20 and costs, \$8.10.
34	Parker Allen.....	Fishing for lobsters without a licence.....	Cape Tormentine.....	Fined \$1 and costs, \$9.70; 1 motor boat and engine confiscated.
35	Oscar Doucet.....	Violation Sect. 18 of Fishery Act.....	St. Charles.....	Fined \$25 and costs, \$3.50 or 30 days in jail.
36	Joseph Vautour.....	Violation Sect. 18 of Fishery Act.....	Rexton.....	Fined \$25 and costs, \$3.50 or 30 days in jail.
37	Amedee Maillet.....	Violation Sect. 18 of Fishery Act.....	Rexton.....	Fined \$25 and costs, \$3.50 or 30 days in jail; 1 Chevrolet coach confiscated.
38	John Baptiste Babineau.....	Fishing for lobsters in close season.....	Northumberland strait.....	Fined \$25 and costs, \$3.40 or 1 month in jail.
39	Nicholas Thibodeau.....	Fishing for lobsters in close season.....	Northumberland strait.....	Fined \$25 and costs, \$7.90 or 1 month in jail.
40	John Maillet.....	Fishing for lobsters in close season.....	Northumberland strait.....	Fined \$5 and costs, \$5.70 or 1 week in jail.
41	Valerie Boucher.....	Fishing for lobsters in close season.....	Northumberland strait.....	Fined \$5 and costs, \$7.35 or 1 week in jail.
42	David A. LeBlanc.....	Fishing for lobsters without licence.....	Little Cape.....	Fined \$5 and costs, \$3.50.
43	Florian Richard.....	Violations of Sect. 18 of Fishery Act.....	Northumberland strait.....	Fined \$25 and costs, \$3.50 or 30 days in jail.
44	Gerald Hebert.....	Violation Sect. 18 of Fishery Act.....	Northumberland strait.....	Fined \$25 and costs, \$3.50 or 30 days in jail.

NEW BRUNSWICK DISTRICT No. 2—*Concluded*

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
45	Harry Fitzpatrick.....	Landing spawn lobsters.....	Bayfield.....	Fined \$100 and costs, \$6.60 or 30 days in jail; 1 motor boat and engine confiscated.
46	Purdy Polley.....	Fishing for lobsters without a licence.....	Botsford.....	Not guilty.
47	Ivon Gallant.....	Fishing lobsters District No. 8 after fishing in District No. 7.	Caisie cape.....	Fined \$5 or 20 days in jail.
48	Pius Bourgeois.....	Fishing lobsters District No. 8 after fishing in District No. 7.	Caisie cape.....	Fined \$5 or 20 days in jail.
49	Frank Biledeau.....	Fishing lobsters District No. 8 after fishing in District No. 7.	Caisie cape.....	Fined \$5 or 20 days in jail.
50	George Legere.....	Fishing lobsters without a licence.....	Caisie cape.....	Fined \$2 or 10 days in jail.
51	Charles Cormier.....	Having in possession undersized oysters.....	Upper Caraqueet.....	Fine suspended; costs, \$2.
52	William Robichaud.....	Illegal possession of lobsters contrary to Section 18 of Fishery Act.	Point Sabin.....	Fined \$10 and costs or 1 week in jail.
53	H. Dexar.....	Having in possession undersized oysters.....	Shediac bridge.....	Fined \$10 and costs, \$3.50.
54	Robert E. Legere.....	Having in possession undersized oysters.....	Shediac bridge.....	Fined \$5 and costs, \$3.50.
55	Jude A. Babin.....	Having in possession undersized oysters.....	Shediac bridge.....	Fined \$5 and costs, \$3.50.
56	X von Gallant.....	Having in possession undersized oysters.....	Shediac bridge.....	Fined \$5 and costs, \$3.50.
57	Sandy Larocque.....	Having in possession undersized oysters.....	Pigeon hill.....	Fined \$2.
58	Simon LeBlanc.....	Fishing for smelts in close season.....	Shemogue river.....	Fined \$1 and costs, \$3.15.
59	Lionel Vautour.....	Fishing for smelts in close season.....	Shemogue river.....	Fined \$1 and costs, \$3.15.
60	Jacob Vautour.....	Fishing for smelts in close season.....	Shemogue river.....	Fined \$1 and costs, \$3.15.
61	Blair Vautour.....	Fishing for smelts in close season.....	Shemogue river.....	Fined \$1 and costs, \$3.15.
62	Henry Legere.....	Fishing for smelts in close season.....	Shemogue river.....	Fined \$1 and costs, \$3.15.
63	Jacob Legere.....	Fishing for smelts in close season.....	Shemogue river.....	Fined \$1 and costs, \$3.15.
64	Tanis Donelle.....	Fishing for smelts in close season.....	Shemogue river.....	Fined \$1 and costs, \$3.15.
65	Leo Donelle.....	Fishing for smelts in close season.....	Shemogue river.....	Fined \$1 and costs, \$3.15.
66	Joseph Cormier.....	Fishing for smelts in close season.....	Shemogue river.....	Fined \$1 and costs, \$3.15.
67	Oliver F. Chiasson.....	Fishing for smelts with a smelt box-net.....	St. Simon river.....	Fined \$1 and costs, \$3.15.
68	Frank Dignard.....	Violation Fishery Regulations contrary to Sect. 20 sub-sect. 5.	Little Tracadie river.....	Fine suspended; costs \$2.
69	John Casey.....	Violation lobster regulations contrary to Sect. 7.	Four Roads.....	Fined \$10 and costs, \$7.
70	Valere Cagnon.....	Violation lobster regulations contrary to Sect. 7.	Four Roads.....	Fined \$10 and costs, \$7.
71	H.M.L. Russell, Hazen Harding, Capt. of boat.	Drifting across statutory line.....	Miramichi bay.....	Fined \$1.
72	John R. MacMaster, Edgar O'Leary, Capt. of boat.	Drifting across statutory line.....	Miramichi bay.....	Fined \$1.
73	Robt. Bremner, John Jimmo, Capt.	Drifting across statutory line.....	Miramichi bay.....	Fined \$1.
74	Everett Williston.....	Drifting across statutory line.....	Miramichi bay.....	Fined \$1.
75	William Legace.....	Caught one salmon with snare.....	Tetagouche river.....	Fined \$1 and costs, \$2.80.
76	Abraham Asouf, Stanley Martin, Capt. of boat.	Drifting across statutory line.....	Miramichi bay.....	Fined \$1.
77	Thomas Nowlan.....	Drifting across statutory line.....	Miramichi bay.....	Fined \$1.

## NEW BRUNSWICK—DISTRICT NO. 3—SUPERVISOR L. H. PARKS

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	Henry Solomon.....	Drifting for salmon.....	Mouth of Tobique river, Victoria co.	Fined \$10 or 20 days in jail; went to jail; costs \$13.45 paid by prosecution.
2	William Sapier.....	Drifting for salmon.....	Mouth of Tobique river, Victoria co.	Fined \$10 or 30 days in jail; went to jail; costs \$16.25 paid by prosecution.
3	Edison Pinder.....	Water pollution.....	Naekawic stream, York co.	Fined \$20; costs nil.
4	Antoine Schiavone.....	Netting whitefish without a permit.....	Baker lake, Madawaska co.	Fine \$25, suspended; costs, \$3.50, paid by defendant.
5	Henri Schiavone.....	Netting whitefish without a permit.....	Baker lake, Madawaska co.	Fine \$25, suspended; costs, \$3.50, paid by defendant.
6	Claud Belanger.....	Netting whitefish without a permit.....	Baker lake, Madawaska co.	Fine \$25, suspended; costs, \$3.50, paid by defendant.
7	Chas. Burbe.....	Non-resident fishing without a licence under Sec. 20, sub-sec. 1, Provincial Act.	St. John river, Victoria co.	Fined \$10; costs \$3.25.
8	Wilnot Hatheway.....	Fishing a gill-net contrary to Section 10, Fishery Regulations.	St. John river, Victoria co.	Information withdrawn; not sufficient evidence; costs, \$5.70, paid by prosecution.
9	Leo Mitchell.....	Undersized grilse in his possession.....	Newcastle, Northumberland co.	Fined \$2; costs \$6.05.
10	Foster E. Belyea.....	Fishing for salmon during weekly close time.....	St. John river, Kings co.	Imposition of sentence suspended; costs \$4 paid by defendant.
11	Robt. H. Cochrane.....	Fishing for salmon during weekly close time.....	St. John river, Kings co.	Fined \$10; costs \$4.
12	Ira Day.....	Fishing for salmon during weekly close time.....	St. John river, Kings co.	Fined \$10; costs \$4.
13	Louis H. Neal.....	Fishing for salmon during weekly close time.....	St. John river, Kings co.	Fined \$10; costs \$4.
14	Wm. Wheaton.....	Fishing for salmon during weekly close time.....	St. John river, Kings co.	Fined \$10; costs \$4.
15	Wm. Henderson.....	Fishing for salmon during weekly close time.....	St. John river, Kings co.	Fined \$10; costs \$4.
16	A. J. Wheaton.....	Fishing for salmon during weekly close time.....	St. John river, Kings co.	Fined \$10; costs \$4.
17	Percy Hitchcock.....	Spearing for salmon.....	St. John river, Victoria co.	Fined \$15, or 20 days in jail; went to jail; costs, \$3.10, paid by prosecution.
18	Geo. L. Fletcher.....	Water pollution.....	Flat Rock brook, Queens co.	Fined \$100; costs \$5.08; fine allowed to stand.
19	Stephen Hitchcock.....	Spearing for salmon.....	St. John river, Victoria co.	Fine, nil; costs \$11.05 paid by prosecution.
20	Kenneth Arbeau.....	Fishing for salmon during close season.....	S.W. Miramichi river, Northumberland co.	Fine, nil; sentence suspended; costs \$6 paid by defendant.
21	Harvey Arbeau.....	Fishing for salmon during close season.....	S.W. Miramichi river, Northumberland co.	Fine, nil; sentence suspended; costs \$6 paid by defendant.
22	John O'Neil.....	Spearing for salmon.....	St. John river, Victoria co.	Fined \$10, or 20 days in jail, and costs \$3.
23	Gifford Watson, Jr.....	Spearing for salmon.....	St. John river, Victoria co.	Fined \$10 or 20 days in jail; costs \$3.
24	George S. Wiggins.....	Water pollution.....	Four Falls brook, Victoria co.	Fined \$20, costs \$1.
25	Chas. Coford, Jr.....	Drifting for salmon.....	S.W. Miramichi river, Northumberland co.	Fined \$1, or 10 days in jail; went to jail; costs, \$2.90 paid by prosecution.
26	Stanley Layton.....	Drifting for salmon.....	S.W. Miramichi river, Northumberland co.	Fined \$1, or 10 days in jail; went to jail; costs, \$2.90 paid by prosecution.



## PRINCE EDWARD ISLAND AND THE MAGDALEN ISLANDS—SUPERVISOR S. T. GALLANT

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
1	J. Ernest Morrison.	Fishing trout in close season.	Wright's pond.	Fined \$20 and costs; suspended sentence; costs paid by defendant.
2	N. Bishop Reid.	Fishing trout in close season.	Wright's pond.	Fined \$20 and costs; suspended sentence; costs paid by defendant.
3	Theron D. Morrison.	Fishing trout in close season.	Wright's pond.	Fined \$20 and costs; suspended sentence; costs paid by defendant.
4	Donald McAusland.	Fishing trout in close season.	Mill river.	Fined \$20 and costs; suspended sentence; costs paid by defendant.
5	Ray Tanton.	Fishing and catching smelts in close season.	St. Eleonors.	Fined \$5 and costs; moiety to R.C.M.P.
5a	Herbert McDonald.	Jigging trout contrary to regulations.	Guerny's stream.	Fined \$10.
5b	Charles Marshall.	Jigging trout contrary to regulations.	Guerny's stream.	Fined \$20 and costs, or 30 days in jail; fine suspended; costs paid by defendant.
6	Ernest Brown.	Netting trout contrary to regulations.	Fortune river.	Fined \$25 and costs, or 1 month in jail; served jail sentence.
7	Reginald Brown.	Netting trout contrary to regulations.	Fortune river.	Fined \$25 and costs, or 1 month in jail; served jail sentence.
8	Merritt Ramsay.	Possession of lobsters in close season.	Campellton.	Fined \$30 and costs, or 1 month in jail.
9	Fred J. Gavin.	Possession of lobsters in close season.	Seacow pond.	Fined \$50 and costs, or 3 months in jail.
10	John Aylward.	Possession of lobsters in close season.	Wood Islands to Bordien.	Fined \$100 and costs, or 4 months in jail; confined to jail but released Sept. 23, 1935, on account of illness.
11	George Champion.	Possession of lobsters in close season.	Barachois near Malpeque.	Fined \$25 and costs, or 2 months in jail.
12	Chas. McDonald.	Possession of lobsters in close season.	Barachois near Malpeque.	Fined \$25 and costs, or 2 months in jail.
13	Jas. A. Champion.	Possession of lobsters in close season.	Barachois near Malpeque.	Fined \$25 and costs, or 2 months in jail.
14	Ben Gallant.	Possession of berried lobsters.	Higgins wharf.	Fined \$100 and costs, or 3 months in jail.
15	Frank O'Halloran.	Possession of lobsters in close season.	Campbellton.	Fined \$50 and costs, or 2 months in jail.
16	Wm. H. Deraspe.	Washing spawn from lobsters.	Grand Entry, Magdalen Isl. ands.	Fined \$20 and costs.
17	Hubert S. Deraspe.	Washing spawn from lobsters.	Grand Entry, Magdalen Isl. ands.	Fined \$40 and costs.
18	Frank McDonald.	Having undersized oysters in possession.	Bristol, Lot 40.	Fined \$1.
	Alfred McDonald.	Having undersized oysters in possession.	Bristol, Lot 40.	Fined \$1.
19	Harry McEwen.	Having undersized oysters in possession.	Bristol, Lot 40.	Fined \$1.
20	Willard Walsh.	Having fished 3 bags of oysters in close season.	East river.	Fined \$5.
21	James Sutherland.	Fishing salmon with gill-nets without a licence.	St. Peter's harbour.	Fined \$5 and costs.
22	Art Sanderson.	Fishing salmon with gill-nets without a licence.	St. Peter's harbour.	Fined \$5 and costs.
	Edward Gallant.	Possession of lobsters in close season.	Five miles from Alberton, in gulf of St. Lawrence.	Fined \$50 and costs, or 20 days in jail; served jail sentence.
23	Everett Powers.	Possession of lobsters in close season.	Five miles from Alberton, in gulf of St. Lawrence.	Fined \$50 and costs, or 20 days in jail; served jail sentence.
24	Sam McEachern.	Placing poles contrary to smelt regulations.	West river.	Fined \$2 and costs, or 10 days in jail.
25	Donald McFadyen.	Placing poles contrary to smelt regulations.	West river.	Fined \$2 and costs, or 10 days in jail.
26	George Darrach.	Placing poles contrary to smelt regulations.	West river.	Fined \$2 and costs, or 10 days in jail.

27	Louis Darrach.....	Placing poles contrary to smelt regulations.....	West river.....	Fined \$2 and costs, or 10 days in jail.
28	Even MacDougall.....	Placing poles contrary to smelt regulations.....	West river.....	Fined \$1 and costs, or 5 days in jail.
29	John Gillis.....	Placing poles contrary to smelt regulations.....	West river.....	Acquitted.
30	John McKinnon.....	Placing poles contrary to smelt regulations.....	West river.....	Acquitted.
31	Albert McDonald.....	Placing poles contrary to smelt regulations.....	West river.....	Acquitted.
32	Ray McLeod.....	Placing poles contrary to smelt regulations.....	West river.....	Acquitted.
33	George McLeod.....	Placing poles contrary to smelt regulations.....	West river.....	Acquitted.
34	Alexander McQuarrie.....	Placing poles contrary to smelt regulations.....	West river.....	Acquitted.
35	Dan McKinnon.....	Placing poles contrary to smelt regulations.....	West river.....	Acquitted.
36	George Sherren.....	Placing poles contrary to smelt regulations.....	West river.....	Acquitted.
37	Daniel McNeill.....	Placing poles contrary to smelt regulations.....	West river.....	Acquitted.
38	John McEachern.....	Placing poles contrary to smelt regulations.....	West river.....	Acquitted.
39	Henry Roberts.....	Placing poles contrary to smelt regulations.....	West river.....	Acquitted.
40	Ray Buell.....	Fishing for oysters contrary to Section 12, sub-section 2a of regulations.....	East river.....	Fined \$5.
41	John A. Austin.....	Fishing for oysters contrary to Section 12, sub-section 2a of regulations.....	East river.....	Fined \$1.
42	James McDonald.....	Fishing smelts in span of bridge contrary to Section 12, sub-section 8, of regulations.....	Glenfinnan river.....	Fined \$10 and costs; 1 bag-net part of penalty.
43	James F. McDonald.....	Fishing for smelts with unlicensed gill-nets.....	Midgell river.....	Fined \$1 and costs.

BRITISH COLUMBIA—CHIEF SUPERVISOR, MAJOR J. A. MOTHERWELL  
DISTRICT No. 1—SUPERVISOR R. W. MACLEOD

1	S. Kamachi.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$2.50 and costs, \$2.50.
2	Chow Man.....	In possession undersized sturgeon.....	Vancouver.....	Fined \$2.50 and costs, \$2.50; 1 sturgeon confiscated.
3	Sakada Ikada.....	Violation Sec. 11, s.s. 2d, Fishery Regulations.....	Mission.....	Fined \$25 and costs, \$1.75; 1 sturgeon confiscated.
4	Simon George.....	Violation Sec. 11, s.s. 2b, Fishery Regulations.....	Mission.....	Suspended sentence.
5	H. C. Meeker.....	Violation Sec. 33, Fisheries Act.....	Ruskin.....	Fined \$5 and costs, \$1.75; salmon gill-net and 12 sockeye salmon confiscated.
6	Harry Joseph.....	Violation Sec. 11, s.s. 3b, Fishery Regulations.....	Fraser river.....	Fined \$10 and costs, \$1.75; salmon gill-net and 12 sockeye salmon confiscated.
7	William Paul.....	Violation Sec. 11, s.s. 3b, Fishery Regulations.....	Fraser river.....	Fined \$2 and costs, 50c.
8	J. Amos Ruelle.....	Violation Sec. 1, s.s. 15f, Fishery Regulations.....	Big Sheep creek.....	Fined \$2 and costs, 50c.
9	Edward Ruelle.....	Violation Sec. 1, s.s. 15f, Fishery Regulations.....	Big Sheep creek.....	Fined \$2 and costs, 50c.; 8 speckled trout confiscated.
10	Arthur Ruelle.....	Violation Sec. 1, s.s. 15f, Fishery Regulations.....	Big Sheep creek.....	Fined \$2 and costs, 50c.; 5 speckled trout confiscated.
11	Olav Jorgensen.....	Violation Sec. 1, s.s. 15f, Fishery Regulations.....	Big Sheep creek.....	Fined \$2 and costs, 50c.; 11 speckled trout confiscated.
12	Reginald Belanger.....	Violation Sec. 1, s.s. 15f, Fishery Regulations.....	Big Sheep creek.....	Fined \$2 and costs, 50c.; 3 speckled trout confiscated.
13	Johmie Chuckite.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.
14	Ivan Bobich.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.

BRITISH COLUMBIA—DISTRICT No. 1—*Concluded*

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
15	Hernian Lewis.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.
16	A. Nicolich.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$75 and costs, \$2.50.
17	Nick Perdia.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.
18	Harry Moore.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.
19	Arnold England.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.
20	H. Martin.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.
21	Olaf Knutson.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$100 and costs, \$2.50.
22	Josif Car.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.
23	Are Trevik.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.
24	Anton Stancic.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$12.50 and costs, \$2.50.
25	Ivan Car.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.
26	Vinko Ivanovic.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.
27	Dan Williams.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$25 and costs, \$2.50.
28	T. Murgatroyd.....	Violation Sec. 22, s.s. 1, Fishery Regulations.....	English bay.....	Fined \$5 and costs, \$2.50.
29	C. MacDonald.....	Violation Sec. 22, s.s. 1, Fishery Regulations.....	English bay.....	Fined \$5 and costs, \$2.50.
30	L. Benedet.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Gulf of Georgia.....	Fined \$100 and costs, \$2.50; 836 salmon confiscated.
31	Frank Lorreta.....	Violation Sec. 22, s.s. 1, Fishery Regulations.....	Fraser river.....	Fined \$2.50 and costs, \$2.50.
32	A. Smithson.....	Violation Sec. 22, s.s. 1, Fishery Regulations.....	Burrard inlet.....	Fined \$10 and costs, \$2.50.
33	W. Gray.....	Violation Sec. 22, s.s. 1, Fishery Regulations.....	Burrard inlet.....	Fined \$10 and costs, \$2.50.
34	R. Gray.....	Violation Sec. 22, s.s. 1, Fishery Regulations.....	Burrard inlet.....	Suspended sentence.
35	Alex Kohut.....	Violation Sec. 16, s.s. 12, Fishery Regulations.....	Shuswap river.....	Suspended sentence; costs, \$3; 2 spears confiscated.
36	Clifford Skryme.....	Violation Sec. 16, s.s. 12, Fishery Regulations.....	Shuswap river.....	Suspended sentence; costs, \$3; lantern confiscated.
37	Shimichi Nakada.....	Violation Sec. 19, s.s. 2a, Fishery Regulations.....	Gulf of Georgia.....	Fined \$15 and costs, \$2.50.
38	Ole Johnston.....	Violation Sec. 19, s.s. 2a, Fishery Regulations.....	Fraser river.....	Fined \$7.50 and costs, \$2.50.
39	Michael Kraff.....	Violation Sec. 16, s.s. 20, Fishery Regulations.....	Mission creek.....	Fined \$5 and costs, \$1.75; dip-net and kokanee confiscated.
40	Louie Schumerr.....	Violation Sec. 16, s.s. 20, Fishery Regulations.....	Mission creek.....	Fined \$5 and costs, \$1.75; dip-net and kokanee confiscated.
41	John Ward.....	Violation Sec. 11, s.s. 2d, Fishery Regulations.....	Mission creek.....	Fined \$5 and costs, \$1.75; few kokanee confiscated.
42	David Culos.....	Violation Sec. 18, Fisheries Act.....	Mission creek.....	Fined \$5 and costs, \$1.75; 25 pounds kokanee confiscated.
43	Carl Frankie.....	Violation Sec. 18, Fisheries Act.....	Mission creek.....	Found guilty and warned; 25 pounds kokanee confiscated.
44	N. Ostafen.....	Violation Sec. 24, s.s. 4-6, Fishery Regulations.....	Okanagan lake.....	Fined \$2 and costs, \$1; dip-net and kokanee confiscated.
45	J. Reed.....	Violation Sec. 16, s.s. 12, Fishery Regulations.....	Okanagan lake.....	Fined \$2 and costs, \$1; dip-net and 20 kokanee confiscated.
46	A. Jakeman.....	Violation Sec. 16, s.s. 12, Fishery Regulations.....	Okanagan lake.....	Fined \$2 and costs, \$1; 20 kokanee confiscated.



47	Pete Weins.....	Violation Sec. 37, Fisheries Act.....	Okanagan lake.....	Fined \$2 and costs, \$1; dip-net confiscated.
48	W. Ramsay.....	Violation Sec. 16, s.s. 12, Fishery Regulations.....	Okanagan lake.....	Fined \$2 and costs, \$1; dip-net and 20 pounds kokanee confiscated.
49	J. Hackman.....	Violation Sec. 24, s.s. 4-6, Fishery Regulations.....	Okanagan lake.....	Fined \$2 and costs, \$1; piece of net confiscated.
50	J. Johnston.....	Violation Sec. 9, s.s. 2a, Fishery Regulations.....	Howe sound.....	Fined \$10 and costs, \$2.50.
51	Sigeru Uyeda.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	McNab creek.....	Fined \$15 and costs, \$2.50.
52	Takeo Furuya.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$20 and costs, \$2.50.
53	H. Hamada.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$10 and costs, \$2.50.
54	S. Higo.....	Violation Sec. 22, s.s. 1, Fishery Regulations.....	Fraser river.....	Fined \$15 and costs, \$2.50.
55	W. Wilson.....	Violation Sec. 22, s.s. 1, Fishery Regulations.....	Fraser river.....	Fined \$15 and costs, \$2.50.
56	R. Jackman.....	Violation Sec. 19, s.s. 2a, Fishery Regulations.....	Fraser river.....	Fined \$2.50 and costs, \$2.50.
57	Anton Mardesich.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Gulf of Georgia.....	Fined \$50 and costs, \$2.50.
58	S. Kanno.....	Violation Sec. 11, Fishery Regulations.....	Fraser river.....	Fined \$25 and costs, \$2.50.
59	Fred Dymtrychon.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Woods lake.....	Fined \$2 and costs, \$1; one gaff confiscated.
60	F. Kipp.....	Violation Sec. 24, Fishery Regulations.....	Woods lake.....	Fined \$2 and costs, \$1; dip-net confiscated.
61	Peter Bebbow.....	Violation Sec. 16, s.s. 12, Fishery Regulations.....	Woods lake.....	Fined \$2 and costs, \$1; one gaff confiscated.
62	Michael Holowich.....	Violation Sec. 24, Fishery Regulations.....	Woods lake.....	Suspended sentence; 1 dip-net confiscated.
63	Harold Iverson.....	Violation Sec. 16, s.s. 16a, Fishery Regulations.....	Squamish river.....	and few kokanee. Fined \$15 and costs, \$2.50.
64	Carl Elleson.....	Violation Sec. 16, s.s. 16a, Fishery Regulations.....	Squamish river.....	Fined \$15 and costs, \$2.50.
65	James Davidson.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Burrard inlet.....	Suspended sentence; \$2.50 costs.
66	Wm. Robertson.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Burrard inlet.....	Fined \$5 and costs, \$2.50.
67	Thomas Christanson.....	Violation Sec. 12, Fishery Regulations.....	Burrard inlet.....	Fined \$5 and costs, \$2.50.
68	Philip Windsor.....	Violation Sec. 16, s.s. 2, Fishery Regulations.....	Fraser river.....	Fined \$15 and costs, \$2.50.
69	T. Kuramoto.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$35 and costs, \$2.50.
70	K. Ikata.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$30 and costs, \$2.50.
71	K. Kuramoto.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Fraser river.....	Fined \$30 and costs, \$2.50.

## DISTRICT No. 2—SUPERVISOR J. BOYD

1	Wm. Mathews.....	Fishing for halibut during closed season.....	Massett area.....	Suspended sentence.
2	John Geddes.....	Fishing for halibut during closed season.....	Massett area.....	Suspended sentence.
3	Jimmy Harris.....	Fishing for halibut during closed season.....	Massett area.....	Suspended sentence.
4	George Fritz.....	Fishing for halibut during closed season.....	Massett area.....	Fined \$100.
5	Kiksuburo Kirusi.....	Fishing for salmon during closed season.....	Chatham sound.....	Fined \$20 and costs, \$2.50.
6	Mark Pavan.....	Fishing for salmon without licence.....	Llama pass.....	Fined \$5 and costs, \$2.45.
7	Mike Brinch.....	Fishing for salmon without licence.....	Llama pass.....	Fined \$5 and costs, \$2.40.
8	Blas Volarie.....	Fishing for salmon without licence.....	Return channel.....	Fined \$5 and costs, \$3.75.
9	Rudolf Mervin.....	Fishing for salmon without licence.....	Ellerslie channel.....	Fined \$6 and costs, \$2.40.
10	Geoffrey White.....	Violation Sec. 11, s.s. 2, Fishery Regulations.....	Naden river.....	Fined \$5 and costs, \$3.75; gill-nets and 47 salmon confiscated.

BRITISH COLUMBIA DISTRICT No. 2—*Concluded*

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
11	Gilbert Bursay	Fishing inside fishery boundary.	Killope river.	Fined \$25; 88 sockeye salmon confiscated.
12	W. S. Flanagan	Fishing inside fishery boundary.	Killope river.	Fined \$25; 9 sockeye salmon confiscated.
13	Charles Shaw	Fishing inside fishery boundary.	Head north Bentinck Arm.	Fined \$20.
14	Jack White	Fishing inside fishery boundary.	Rivers inlet.	Fined \$1; 22 sockeye salmon confiscated.
15	T. Miki	Fishing inside fishery boundary.	Rivers inlet.	Fined \$5.
16	Oliver Watson	Fishing inside fishery boundary.	Rivers inlet.	Fined \$5; 5 sockeye salmon confiscated.
17	Billy Mitchell	Fishing inside fishery boundary.	Rivers inlet.	Fined \$25; 3 sockeye salmon confiscated.
18	Tom Duncan	Fishing inside fishery boundary.	Rivers inlet.	Fined \$5.
19	Dominic Point	Fishing inside fishery boundary.	Rivers inlet.	Fined \$5; 13 sockeye salmon confiscated.
20	Ambrose Point	Fishing inside fishery boundary.	Rivers inlet.	Fined \$5; 5 sockeye salmon confiscated.
21	Charles Rendal	In possession of fish during closed season.	Smiths inlet.	Fined \$50; gas boat, net and 43 sockeye salmon confiscated.
22	Joe Jeffries	Fishing inside fishery boundary.	Rivers inlet.	Fined \$15; 9 sockeye salmon confiscated.
23	Oscar Grant	Fishing inside fishery boundary.	Rivers inlet.	Fined \$25; 13 sockeye salmon confiscated.
24	John Grant	Fishing inside fishery boundary.	Rivers inlet.	Fined \$25; 26 sockeye salmon confiscated.
25	Taiso Hamasaki	Fishing during weekly closed season.	Inverness pass.	Fined \$30 and costs, \$2.50.
26	Aubrey Jackson	Fishing during weekly closed season.	Chatham sound.	Fined \$50 and costs, \$2.50.
27	Louis Hall	Fishing inside fishery boundary.	Big bay.	Fined \$125 and costs, \$2.50.
28	E. F. Dudoward	Fishing inside fishery boundary.	Borrowman bay.	Case dismissed.
29	E. F. Dudoward	In possession salmon in closed area.	Borrowman bay.	Case dismissed.
30	Richard Gammon	Fishing inside fishery boundary.	Roscoe inlet.	Fined \$100 and costs, \$3.75.
31	Marion Skog	Fishing inside fishery boundary.	Roscoe inlet.	Fined \$50 and costs, \$1.75.
32	Andrew Aursi	Fishing inside fishery boundary.	Roscoe inlet.	Fined \$50 and costs, \$1.75.
33	Sven Skog	Fishing inside fishery boundary.	Roscoe inlet.	Fined \$50 and costs, \$1.75.
34	Oskar Havroy	Fishing inside fishery boundary.	Roscoe inlet.	Fined \$50 and costs, \$1.75.
35	John Johnson	Fishing inside fishery boundary.	Roscoe inlet.	Fined \$50 and costs, \$1.75.
36	Tom Dingwall	Acting as boat puller without a licence.	Roscoe inlet.	Fined \$50 and costs, \$1.75.
37	Sam McAllister	Fishing inside fishery boundary.	Rivers inlet.	Fined \$10.
38	Eric Wood	Fishing inside fishery boundary.	Rivers inlet.	Fined \$25; 9 sockeye salmon confiscated.
39	Arne Rasmussen	Fishing inside fishery boundary.	Rivers inlet.	Fined \$25.
40	Alfred Thompson	Fishing inside fishery boundary.	Rivers inlet.	Fined \$25; 30 sockeye salmon confiscated.
41	Alexander Backie	Fishing with net in excess of legal length.	Rivers inlet.	Fined \$287 10; 97 fathoms net confiscated.
42	Peter Stevens	Fishing inside fishery boundary.	Rivers inlet.	Fined \$200; seine boat, purse-seine and 1,545 salmon confiscated.
43	Hakugi Yuasa	Fishing inside fishery boundary.	Ecsall river.	Fined \$25 and \$2.50 costs; 8 coho salmon confiscated.
44	Michi Sekitani	Fishing inside fishery boundary.	Ecsall river.	Fined \$25 and costs, \$2.50; 9 coho salmon confiscated.

## DISTRICT No. 3—SUPERVISOR J. F. TAIT

1	Leonard Ryan.....	Violation Sec. 39, Fisheries Act.....	Cowichan river.....	Fined \$100 and costs, \$3.75; fine reduced to \$10 on appeal.
2	Alex Brown.....	Violation Sec. 39, Fisheries Act.....	Cowichan river.....	Fined \$100 and costs, \$3.75; fine remitted by Minister.
3	Leonard Ryan.....	Violation Sec. 1, s.s. 12d, Fishery Regulations.....	Cowichan river.....	Fined \$5 and costs, \$3.75.
4	Alex Brown.....	Violation Sec. 1, s.s. 12d, Fishery Regulations.....	Cowichan river.....	Fined \$5 and costs, \$3.75.
5	Charles Lundahl.....	Violation Sec. 1, s.s. 12d, Fishery Regulations.....	Cowichan river.....	Fined \$20 and costs, \$3.75.
6	H. Bliss Canning.....	Violation Sec. 1, s.s. 12d, Fishery Regulations.....	Cowichan river.....	Fined \$10 and costs, \$3.75.
7	Kingo Sato.....	Violation Sec. 52, para. a and d, Fisheries Act.....	Quathiaski cove.....	Fined \$10 and costs, \$2.
8	M. Noda.....	Violation Sec. 52, para. a and d, Fisheries Act.....	Quathiaski cove.....	Fined \$5 and costs, \$2.
9	Y. Hashimoto.....	Violation Sec. 52, para. a and d, Fisheries Act.....	Quathiaski cove.....	Fined \$5 and costs, \$2.
10	D. Lalonde.....	Violation Sec. 1, s.s. 4, Fishery Regulations.....	Finlayson arm.....	Fined \$5 and costs, \$3.75.
11	A. Whittingham.....	Violation Sec. 1, s.s. 4, Fishery Regulations.....	Finlayson arm.....	Fined \$5 and costs, \$3.75.
12	Roy A. Darville.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Esperanza inlet.....	Fined \$10 and costs, \$2.50.
13	Arne Rasmussen.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobartton river.....	Fined \$20 and costs, \$2; 19 sockeye salmon confiscated.
14	Arne Rasmussen.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobartton river.....	Fined \$10; 24 sockeye salmon confiscated.
15	Wm. McKenzie.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobartton river.....	Fined \$10 and costs, \$2; 4 sockeye salmon confiscated.
16	Donald Reid.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobartton river.....	Fined \$20 and costs, \$2; 3 sockeye salmon confiscated.
17	Asbjør Mikelson.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobartton river.....	Fined \$10.
18	Leo Thomas.....	Violation Sec. 19, Fishery Regulations.....	Nitinat arm.....	Fined \$2.
19	Gilbert Livingstone.....	Violation Sec. 13, Fishery Regulations.....	Nitinat arm.....	Case dismissed.
20	Pete Mitchell.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Hobartton river.....	Case dismissed.
21	L. Wilby.....	Violation Sec. 1, s.s. 4, Fishery Regulations.....	Finlayson arm.....	Fined \$5 and costs, \$3.75.
22	Otomatsu Ishida.....	Violation Sec. 19, s.s. 2, Fishery Regulations.....	Loughboro inlet.....	Fined \$15 and costs, \$2.50; 20 fathoms of net confiscated.
23	Norman Lee.....	Violation Sec. 19, s.s. 2, Fishery Regulations.....	Loughboro inlet.....	Fined \$10 and costs, \$2.50; 20 fathoms of net confiscated.
24	George Gus.....	Violation, Sec. 16, s.s. 16, Fishery Regulations.....	Somass river.....	Suspended sentence; salmon, drag-seine and two Indian canoes confiscated.
25	Louie Bob.....	Violation Sec. 16, s.s. 26, Fishery Regulations.....	Deepwater bay.....	Case dismissed.
26	Ernest Joseph.....	Violation Sec. 16, Fishery Regulations.....	Somass river.....	Suspended sentence.
27	Jack Yukum.....	Violation Sec. 16, Fishery Regulations.....	Somass river.....	Suspended sentence.
28	Alfred Joseph.....	Violation Sec. 16, Fishery Regulations.....	Somass river.....	Suspended sentence.
29	Billy Yokum.....	Violation Sec. 16, Fishery Regulations.....	Somass river.....	Suspended sentence.
30	Jintaro Kitano.....	Violation, Sec. 16, s.s. 2, Fishery Regulations.....	Paynes sound.....	Case dismissed.
31	Jintaro Kitano.....	Violation Sec. 4, s.s. 2, Fishery Regulations.....	Paynes sound.....	Fined \$25 and costs, \$14.25.
32	Toralf W. Rasch.....	Violation Sec. 16, Fishery Regulations.....	Sarita bay.....	Fined \$10 and costs, \$2.50.
33	Otomatsu Ishida.....	Allowing salmon gill-net to drift over boundary.....	Keogh river.....	Fined \$25.
34	Mike Joliffe.....	Operating salmon gill-net above boundary.....	Keogh river.....	Case dismissed.
35	James Lawson.....	Operating salmon gill-net above boundary.....	Keogh river.....	Case dismissed.
36	Frank Ferrario.....	Using salmon purse-seine as set net.....	Robson bight.....	Fined \$50.
37	United Logging Co.....	Permitting slack and other debris to enter river.....	Hoeve river.....	Fined \$100 and costs, \$2.50.
38	Frank Wilson.....	Violation Sec. 16, Fishery Regulations.....	Cowichan river.....	Fined \$20 and costs, \$3.75.



BRITISH COLUMBIA DISTRICT No. 3—*Concluded*

No. of Pros.	Name of Offender	Nature of Offence	Place of Offence	Result of Prosecution
39	Tomokichi Ishihara.....	Allowing gill-net to drift over boundary.....	Keogh river.....	Fined \$25.
40	Alex Thompson.....	Allowing purse-seine to drift over boundary.....	Robson river.....	Suspended sentence; \$3.75 costs.
41	James Henderson.....	Allowing purse-seine to drift over boundary.....	Robson river.....	Suspended sentence; \$3.75 costs.
42	Robert Bell.....	Allowing purse-seine to drift over boundary.....	Robson river.....	Suspended sentence; \$3.75 costs.
43	Peter Pillman.....	Allowing salmon gill-net to drift above boundary.....	Keogh river.....	Fined \$25 and costs, \$1.75.
44	Edward Tatoosh.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Somass river.....	Fined \$10; gill-net, canoe and 50 pounds salmon confiscated.
45	W. P. Sedgmen.....	Violation Sec. 1, s.s. 4, Fishery Regulations.....	Finlayson arm.....	Fined \$5 and costs, \$3.75.
46	Wesley Gibbons.....	Fishing with gill-net above fishery boundary.....	Kingcome river.....	Fined \$25.
47	Nelson Grant.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Somass river.....	Fined \$10; salmon gill-net confiscated.
48	John Yukum.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Somass river.....	Suspended sentence; salmon gill-net and 50 pounds of salmon confiscated.
49	Kapoor Lumber Co.....	Violation Sec. 61, Fisheries Act.....	Deer creek.....	Fined \$20 and costs, \$3.50.
50	Leon Brekke.....	Operating purse-seine inside fishery boundary.....	Keogh river.....	Fined \$5 and costs, \$3.75.
51	Carl Ellison.....	Violation Sec. 16, s.s. 16a, Fishery Regulations.....	Homalka river.....	Fined \$25.
52	A. V. Pekonen.....	Violation Sec. 16, s.s. 16a, Fishery Regulations.....	Homalka river.....	Fined \$25.
53	John A. Roos.....	Operating gill-net above fishery boundary.....	Wakeman river.....	Fined \$25 or 14 days in gaol; went to gaol.
54	Oscar Roos.....	Operating gill-net above fishery boundary.....	Wakeman river.....	Fined \$25 or 14 days in gaol; went to gaol.
55	Wm. Petrie.....	Violation Sec. 16, Fishery Regulations.....	Zeballos arm.....	Fined \$10 and costs, \$2.50.
56	Lewis Crook.....	Violation Sec. 1, s.s. 2, Fishery Regulations.....	Cowichan bay.....	Fined \$10 and costs, \$3.75.
57	Joe Hayes.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Sartia bay.....	Case dismissed.
58	Joseph Katnch.....	Violation Sec. 16, s.s. 19, Fishery Regulations.....	Granite bay.....	Fined \$50 and costs, \$2.50; 70 salmon confiscated.
59	Walter Cornwall.....	Violation Sec. 1, s.s. 4, Fishery Regulations.....	Cowichan bay.....	Fined \$5 and costs, \$1.75.
60	Douglas Pullen.....	Violation Sec. 1, s.s. 4, Fishery Regulations.....	Cowichan bay.....	Fined \$10 and costs, \$3.75.
61	Joseph Silvey.....	Violation Sec. 16, s.s. 11b, Fishery Regulations.....	Stuart channel.....	Fined \$200 and costs, \$4.75; gas boat and gill-net confiscated; case appealed.
62	Jack Jolliffe and Mike Jolliffe.....	Carrying fish from above to below fishery boundary Carrying fish from above to below fishery boundary	Port Neville..... Port Neville.....	Fined \$25 and costs, \$2.25. Fined \$50 and costs, \$2.25; 29 salmon confiscated.
63	Luigi Benedet.....	Violation Sec. 22, s.s. 2, Fishery Regulations.....	Comox harbour.....	Fined \$50 and costs, \$2.50.
64	Jack Jolliffe.....	Violation Sec. 39, Fisheries Act.....	Salmon river.....	Fined \$30 and costs, \$9.40.
65	Mike Jolliffe.....	Violation Sec. 39, Fisheries Act.....	Salmon river.....	Fined \$30 and costs, \$9.40.
66	Harry Moon.....	Violation Sec. 16, s.s. 19, Fishery Regulations.....	Johnstone straits.....	Fined \$150 and costs, \$2.50.
67	Andeo Serka.....	Violation Sec. 11, s.s. 3, Fishery Regulations.....	Nodales channel.....	Fined \$2.50 and costs, \$2.50.
68	George Perdia.....	Violation Sec. 39, Fishery Act.....	Okissala channel.....	Fined \$100 and costs, \$2.50.
69	George Marinkovich.....	Violation Sec. 23, s.s. 2, Fishery Regulations.....	Nodales channel.....	Suspended sentence; costs, \$2.50.
70	Jack Silvey.....	Violation Sec. 16, s.s. 11b, Fishery Regulations.....	Stuart channel.....	Fined \$50; appeal pending.
71	Jack Silvey.....	Violation Sec. 39, Fisheries Act.....	Stuart channel.....	Fined \$50 and costs, \$2.25; 245 chum salmon confiscated.
72	Jimmie Johnston.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Stuart creek.....	Fined \$50 and costs, \$2.25; 245 chum salmon confiscated.
73	Matthew Martinovich.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Little Qualicum.....	Fined \$25 and costs, \$2.
74	Dimko Anzulovich.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Little Qualicum.....	Fined \$25 and costs, \$2.

75	Olaf Knutson.....	Violation Sec. 22, para. 2, Fishery Regulations.....	Nanaimo harbour.....	Fined \$25 and costs, \$2.
76	Randolf Thompson.....	Violation Sec. 16, s.s. 11b, Fishery Regulations.....	Stuart channel.....	Fined \$10 and costs, \$3.75.
77	Domingo Silvey.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Stuart channel.....	Fined \$5 and costs, \$1.75.
78	Arnold Crocker.....	Violation Sec. 11, s.s. 1a, Fishery Regulations.....	Stuart channel.....	Fined \$5 and costs, \$1.75.
79	Benedict Jack.....	Violation Sec. 16, s.s. 16, Fishery Regulations.....	Tahsis channel.....	Fined \$100.
80	John Beaton.....	Violation Sec. 16, s.s. 2, Fishery Regulations.....	Powell river.....	Fined \$25 and costs, \$4.50; or 1 month in gaol; went to gaol.
81	James Stewart.....	Violation Sec. 16, s.s. 2, Fishery Regulations.....	Powell river.....	Fined \$5 and costs, \$4.50.
82	J. L. Silvey.....	Violation Sec. 16, s.s. 11b, Fishery Regulations.....	Stuart channel.....	Fined \$50 and costs, \$3.75; seine boat confiscated.
83	James Silvey.....	Violation Sec. 16, s.s. 11b, Fishery Regulations.....	Stuart channel.....	Fined \$2.
84	P. Cathey.....	Violation Sec. 16, s.s. 11b, Fishery Regulations.....	Stuart channel.....	Fined \$2.
85	Geo. Basso.....	Violation Sec. 16, s.s. 11b, Fishery Regulations.....	Stuart channel.....	Fined \$2.
86	Wilbert Smith.....	Violation Sec. 16, s.s. 11b, Fishery Regulations.....	Stuart channel.....	Fined \$2.
87	Raymond Modiste.....	Violation Sec. 11, s.s. 2, Fishery Regulations.....	Cowichan river.....	Fined \$1 and costs, \$1.75.
88	Harry Elliott.....	Violation Sec. 11, s.s. 2, Fishery Regulations.....	Cowichan river.....	Fined \$1 and costs, \$3.75 or 7 days in gaol; went to gaol.
89	John MacDonald.....	Violation Sec. 16, s.s. 2, Fishery Regulations.....	Powell river.....	Fined \$5 and costs, \$4.50.

## AT VANCOUVER—CHIEF SUPERVISOR J. A. MOTHERWELL

A-1	Hans Jacob Langaker.....	Violation Sec. 11, s.s. 1, Fishery Regulations.....	Gulf of Georgia.....	Fined \$10 and costs, \$6.
A-2	Torgils Jensen.....	Violation Sec. 11, s.s. 1, Fishery Regulations.....	Gulf of Georgia.....	Fined \$10 and costs, \$2.50.
A-3	Ivan Matanic.....	Violation Sec. 11, s.s. 1, Fishery Regulations.....	Gulf of Georgia.....	Fined \$5 and costs, \$4.50.
A-4	John Vukovich.....	Violation Sec. 16, s.s. 16a, Fishery Regulations.....	Fish Eggs creek.....	Fined \$150 and costs, \$7.50 or 60 days in gaol; went to gaol.
A-5	John Vukovich.....	Violation Sec. 16, s.s. 16a, Fishery Regulations.....	Gull Chuck creek.....	Fined \$50 and costs, \$2.50 or 60 days in gaol; went to gaol.
A-6	Malcolm Silvey.....	Violation Sec. 16, s.s. 16a, Fishery Regulations.....	Vancouver bay.....	Fined \$50 and costs, \$2.50.













Zool.

Zool.



